

STUDIES OF PACIFIC ISLAND PLANTS, XIX.
THE ARALIACEAE OF THE NEW HEBRIDES, FIJI, SAMOA,
AND TONGA¹

ALBERT C. SMITH AND BENJAMIN C. STONE

THIS REGIONAL TREATMENT of the Araliaceae is primarily directed toward an adequate understanding of the species native to Fiji. Although only three genera (*Polyscias*, *Plerandra*, and *Schefflera*) occur indigenously in that archipelago, an examination of the family in the nearby island groups has proved instructive. In the area of our present concern species of *Polyscias*, *Brassaia*, and *Dizygotheca* occur as cultivated or adventive plants, and for convenience we also include these records.

Generic limits in the Araliaceae have presented problems to students of the group, and we are well aware that a limited and regional treatment can add little to their solution. In his recent attempt to bring taxonomic order into the family, Hutchinson (Gen. Fl. Pl. 2: 52-81. 1967) has recognized 84 genera, rearranging them in seven tribes. Harms' treatment of 1894 (in E. & P. Nat. Pflanzenfam. 3(8): 1-62) had accepted 51 genera in three tribes. Hutchinson has proposed two new tribes (*Cussonieae* and *Anomopanaceae*) for taxa that have their flowers singly disposed rather than in umbels. His first 12 genera, removed from the rest of the family on that basis, seem to form an unnatural aggregation. As a single example, the genus *Polyscias* is not amenable to this tribal categorization; its species are usually umbelliferous, but some of them have the flowers individually borne on the ultimate inflorescence-branches, and other species are transitional in this character. We find *Polyscias* to be a satisfactory and coherent genus, as noted in our generic consideration, below, and in our notes under *P. joskei* and *P. reineckei*. By combining *Anomopanax* Harms (the basis of Hutchinson's tribe *Anomopanaceae*) with *Mackinlaya* F. v. Muell. (the basis of the tribe *Mackinlayeae* of both Harms and Hutchinson), Philipson (in Bull. Brit. Mus. (Nat. Hist.) Bot. 1: 3-9. 1951) has also indicated his lack of confidence in the value of umbellate or single flowers as a generic character. Our comments below under *Plerandra insolita* will further illustrate the difficulties of utilizing this character for generic delimitation.

In connection with the present paper the herbarium material of several

¹ No. XVIII of this series, by the first author, was published in Contr. U.S. Natl. Herb. 37: 69-106. 1967. The present paper is based on research partially supported by a grant from the National Science Foundation. Our work on the Araliaceae was initiated while both authors were staff members of the Smithsonian Institution, and we take this opportunity of thanking Dr. Wallace R. Ernst, of that organization, for his interest in the problem, his advice, and his aid in handling borrowed material.

institutions has been examined and is cited, with the indicated abbreviations: Arnold Arboretum of Harvard University (A); Bernice P. Bishop Museum (BISH); British Museum (BM); Gray Herbarium of Harvard University (GH); Royal Botanic Gardens, Kew (K); New York Botanical Garden (NY); Department of Agriculture, Suva, Fiji (SUVA); University of California, Berkeley (UC); and U.S. National Herbarium (US). We are indebted to the administrators of these herbaria for the privilege of examining the cited specimens. The accompanying illustrations were prepared by the second author.

KEY TO THE GENERA

- Petals imbricate in bud (tribe Aralieae); leaves imparipinnate; flowers in umbels, the pedicels conspicuously articulate at apex; petals and stamens 5; styles and ovary-locules 2 (rarely 3); fruits ellipsoid or obovoid. 1. *Delarbrea*.
- Petals valvate, broad at base (tribe Schefflereae).
- Flowers densely congested in heads, unisexual; fruits sessile, free to firmly concrescent; leaves simple, obovate to oblanceolate. 2. *Meryta*.
- Flowers pedicellate (or, if capitate, the leaves compound); fruits not concrescent.
- Leaves pinnately compound or unifoliolate.
- Pedicels articulate at apex; petals and stamens (in our species) 5–8 (rarely 4 or 9); styles and ovary-locules (in our species) 2–5; fruits often laterally compressed (sometimes subglobose), the styles often conspicuous and persistent (but sometimes stigmas sessile on a conical stylopodium). 3. *Polyscias*.
- Pedicels not articulate; petals and stamens 8–12; styles and ovary-locules 8–24; fruits subglobose, surmounted by a truncate-conical stylar column with numerous radiating sessile stigmas. 4. *Reynoldsia*.
- Leaves palmately lobed or compound.
- Leaves digitately compound, with petiolulate leaflets.
- Stamens numerous, 15–500, exceeding the petals in number; petals 4–6; styles, stigmas, and ovary-locules 5–17. 5. *Plerandra*.
- Stamens 4–6, similar to the petals in number; styles, stigmas, and ovary-locules 5–12.
- Anthers 2-locular.
- Flowers pedicellate. 6. *Schefflera*.
- Flowers sessile in heads borne along the radiating branches of large panicles. 7. *Brassaia*.
- Anthers 4-locular. 8. *Dizygotheca*.
- Leaves palmately lobed, with toothed or incised segments; umbels tripartite, the central radiolus bearing infertile or pseudopistillate flowers, the lateral radioli with hermaphrodite flowers. 9. *Boerlagiodendron*.

1. *Delarbrea* Vieill. in Bull. Soc. Linn. Norm. 9: 342. 1865; Harms in E. & P. Nat. Pflanzenfam. 3(8): 61. 1894; Hutchinson, Gen. Fl. Pl. 2: 63. 1967.

This small genus, of about seven species, is centered in New Caledonia

but extends from Timor and New Guinea through the Solomon Islands into the New Hebrides; it is typified by *D. collina*, the only species occurring in our area. Our specific description is based on New Hebridean and New Caledonian material. Both Harms and Hutchinson place *Delarbrea* in the tribe Aralieae, characterized by having the petals broad-based and imbricate in bud.

1. *Delarbrea collina* Vieill. in Bull. Soc. Linn. Norm. 9: 342. 1865; Guillaumin in Bull. Soc. Bot. France 66: 270. 1919, in *op. cit.* 74: 698. 1927, in Jour. Arnold Arb. 12: 262. 1931, in Jour. Linn. Soc. Bot. 51: 553. 1938; Philipson in Bull. Brit. Mus. (Nat. Hist.) Bot. 1: 18. 1951. PL. III, FIGS. 10-13.

A tree, glabrous throughout; leaves imparipinnate, large, up to 85 cm. long, the petiole and rachis subterete, the petiole of mature leaves 12-15 cm. long, swollen to a clasping base and obviously alate in the proximal 1.5-2 cm., the leaflets 11-19, the petiolules slender, of lateral leaflets 3-11 and of terminal leaflet to 40 mm. long, the blades chartaceous, oblong or oblong-lanceolate, 12-20 cm. long and 4-7 cm. broad (basal ones sometimes smaller), unequally subcordate to broadly obtuse at base, acute to sharply short-acuminate at apex, entire at margin, the costa raised above, prominent beneath, the secondary nerves usually 7-10 per side, curved-ascending, with the intricate veinlet-reticulation prominulous on both surfaces; inflorescences racemose-paniculate, up to 45 cm. long and broad, the primary branches to 25 cm. long, all the inflorescence-axes transversely griseo-corticate-lenticillate, the primary bracts oblong, 0.5-1 cm. long or more, caducous, the umbel- and flower-subtending bracts and bracteoles 1.5-3 mm. long, obtuse or subacute; flowers borne in umbels on slender ultimate peduncles (5-) 10-30 mm. long, 15-25 per umbel, the pedicels 1-3 mm. long at anthesis, slightly elongating in fruit, swollen and conspicuously articulate at apex; flowers 3-3.5 mm. long at anthesis, with a narrowly turbinate calyx 2-2.6 mm. long, the tube obconical, the limb subcampanulate, 1.5-2 mm. in apical diameter, the lobes 5, obvious, orbicular-ovate, 0.5-0.7 mm. long, narrowly imbricate in bud; petals 5, oblong-ovate, broad-based, about 1.5 mm. long, imbricate in bud; stamens 5, the filaments slender, eventually about 1.5 mm. long, the anthers oblong, about 0.8 mm. long, versatile; stylopodium hemispheric, 0.5-0.7 mm. high, surmounted by 2 (rarely 3) styles free nearly to base, these elongating to 1.5 mm., eventually recurved and subclavate, with decurrent stigmas; fruits ellipsoid or obovoid, 10-15 mm. long, only slightly compressed laterally, 2- or sometimes 3-locular, each locule containing a marginal pyrene angular-lunulate in cross-section, the fruit thus with an empty central cavity, the sepals persistent, the styles usually caducous.

TYPE LOCALITY: New Caledonia; the type is *Vieillard 625*, from the vicinity of Wagap (isotype at A).

DISTRIBUTION. New Caledonia, Loyalty Islands, Solomon Islands, and New Hebrides, apparently occurring in forest from sea-level to an alti-

tude of 200 meters. Trees up to 12 meters high have been noted, and the fruit is said to be black when mature.

LOCAL NAMES. Reported names in the New Hebrides are *morshmorshalkara* and *nëvarkrab* (Espiritu Santo), *napouiri* (Efate), and *nunginetum* (Eromanga).

New Hebrides. BANKS GROUP: VANUA LAVA: *Kajewski 412* (A, BISH). ESPIRITU SANTO: Hog harbour, *I. & Z. Baker 72* (BM), *295* (BM). EROMANGA: Dillon Bay, *Kajewski 269* (A, US).

The New Caledonian species, with the exception of this one widespread one, appear to be endemic. Among them (according to Guillaumin, *Fl. Anal. et Syn. Nouv.-Caléd.* 251. 1948), *D. collina* is distinguished by its acute, not falciform, leaflet-blades, and its relatively small flowers and fruits.

2. *Meryta* J. R. & G. Forst. *Char. Gen. Pl.* 119. 1776; Seem. in *Bonplandia* 10: 294. 1862, *Fl. Vit.* 118. 1865; Harms in *E. & P. Nat. Pflanzenfam.* 3(8): 34. 1894, in *Notizbl. Bot. Gart. Berlin* 14: 315. 1938; Hutchinson, *Gen. Fl. Pl.* 2: 74. 1967.

Botryodendrum Endl. *Prodr. Fl. Norfolk.* 62. 1833.

Neara Sol. ex Seem. *Fl. Vit.* 118, as synonym. 1865.

Strobilopanax Viguier in *Ann. Sci. Nat. IX. Bot.* 4: 148. 1906.

The interesting genus *Meryta*, typified by *M. lanceolata* J. R. & G. Forst., of the Society Islands (cf. Forst. f. *Fl. Ins. Austr. Prodr.* 92. 1786), is readily distinguished by its large, simple leaves, of which the blades are usually obovate or oblanceolate, and its unisexual, sessile flowers crowded in capitate-paniculate inflorescences. The fruits are either free or firmly conerescent, thus indicating that the character upon which *Strobilopanax* was based is not dependable at the generic level.

Meryta is indicated by Harms (in 1938) to include about 30 species, by Hutchinson (in 1967) to include 16 species. It has its greatest concentration in New Caledonia, but it is now known to extend from New Zealand, Norfolk Island, New Guinea, and the Palau and Marianas Islands eastward through Polynesia to the Austral Islands, the Tuamotus, and the Marquesas. In this vast area, the only major archipelago lacking the genus is Fiji, a very curious fact but one that must now be taken at face value, since Fiji is better known than most Pacific areas and since the genus can scarcely be confused with any other.

The genus is greatly in need of a complete review, since specific characters are evasive. In our area at least one species occurs in the New Hebrides and one or two in Samoa and Tonga. We are able to record little new information, but the following key and pertinent bibliographic and herbarium records will summarize an unsatisfactory situation.

KEY TO THE SPECIES

Fruiting heads composed of fruits firmly conerescent except in the distal portion, or at least united above the middle.

- Petioles 1–1.5 cm. long; leaf-blades 28–32 cm. long, obtuse at apex; fruiting heads at apparent maturity about 4 cm. in diameter. . . . 1. *M. neo-ebudica*.
 Petioles 2–16 cm. long; leaf-blades 40–63 cm. long, acute to acuminate at apex; fruiting heads at apparent maturity 2–3.5 cm. in diameter. . . . 2. *M. capitata*.
 Fruiting heads composed of fruits nearly free or united only below the middle.
 Petioles up to 23 cm. long; leaf-blades 40–75 cm. long, cuspidate to short-acuminate at apex. 3. *M. macrophylla*.
 Petioles 4–8 cm. long; leaf-blades 45–120 cm. long, obtuse to acute at apex. 4. *M. denhamii*.

1. *Meryta neo-ebudica* (Guillaumin) Harms in Notizbl. Bot. Gart. Berlin 14: 321. 1938.

Strobilopanax neo-ebudicus Guillaumin in Jour. Arnold Arb. 12: 263. 1931.

As we have seen no additional material of this species, the original description based on the type collection cannot be significantly amplified.

TYPE LOCALITY: Aneityum, New Hebrides; the type is *Kajewski 980* (coll. *J. P. Wilson*), cited below.

DISTRIBUTION. Endemic to the New Hebrides and known definitely only from the type collection, obtained in forest at an altitude of 325 m. and noted as a small tree with white flowers and yellow fruits.

LOCAL NAME. *Nabrouto* was noted by the collector.

New Hebrides. ANEITYUM: Anelgauhat Bay, September 1929, *Kajewski 980* (coll. *J. P. Wilson*) (A type).

Guillaumin notes his novelty as the first record of *Strobilopanax* in the New Hebrides, but he has also indicated the presence of *Meryta* in that archipelago. Earlier (in Bull. Soc. Bot. France 66: 270. 1919, in *op. cit.* 74: 698. 1927) he had reported the genus from Efate, with the local name *nafil gnas*; and more recently (in Jour. Linn. Soc. Bot. 51: 554. 1938) he has reported it from Espiritu Santo, with the local name *nvalval*. The specimens supporting these records have not been examined by us.

2. *Meryta capitata* Christophersen in Bishop Mus. Bull. 128: 161. fig. 23. 1935; Yuncker in Bishop Mus. Bull. 184: 55. 1945.

Meryta sp. Christophersen in Bishop Mus. Bull. 128: 164. 1935.

Meryta aff. macrophylla sensu Yuncker in Bishop Mus. Bull. 184: 56. 1945.

In view of our uncertainty of the actual limits of this species or, indeed, of its real distinctness from *M. macrophylla* (see comments below), we refrain from amplifying the original description, which Christophersen seems to have based entirely upon fruiting specimens — his type and his no. 2839.

TYPE LOCALITY: Near Vaipouli, Savaii, Samoa; the type is *Christophersen & Hume 1913*, cited below.

DISTRIBUTION. Endemic to Samoa, and definitely known from Savaii and the Manua Islands, where it has been collected in forest from near sea-level to 500 m. altitude (with one collection from about 1,400 m. above Matavanu, Savaii) and noted as a tree 4–6 m. high.

LOCAL NAMES. *Fagu fagu* (i.e. *fangu fangu*) is a general name; it has also been recorded on Savaii as *lauma ulu ulu*, and on Olosega as *lau tetali*.

Samoa. SAVAII: Falealupo, *Christophersen 2802* (BISH); Manese plantation, *Christophersen & Hume 2369* (BISH); behind Avao, *Vaupel 135* (BISH); back of Vaipouli, *Christophersen & Hume 1913* (A, BISH type, US); near Vaipouli, *Christophersen & Hume 1837* (A, BISH); above Matavanu, *Christophersen & Hume 2199* (BISH); Taga, *Christophersen 2839* (BISH, US). OFU: Above Ofu village, *Yuncker 9545* (BISH). OLOSEGA: Oloseguata, Piumafua Ridge, *Garber 1079* (BISH). TAU: Amouli trail, *Garber 622* (A, BISH); south of Siufaga, *Yuncker 9162* (BISH).

It may be seriously doubted that more than one species of *Meryta* occurs in Samoa and Tonga. As characters to differentiate his *M. capitata* from *M. macrophylla* Christophersen mentions the subglobose heads of united fruits and the broader leaves. The latter of these is surely of little consequence, as there is substantial variation in leaf-breadth and also in petiole-length in plants that otherwise seem essentially identical.

Fruiting specimens referable to *M. macrophylla* (*U.S. Expl. Exped.*, the type, *Setchell 15667*, *Bryan 99*, *Christophersen 1253*, and *Yuncker 16181*) have the fruits united only in the basal portion or up to the middle. Fruiting specimens referable to *M. capitata* (*Christophersen & Hume 1913*, the type; *Vaupel 135*, *Christophersen 2839*, and *Yuncker 9162*) have the fruits concrescent except in the uppermost portion, which is rounded and obtusely costate when dried. The dividing line between the two conditions is not entirely clear, and indeed is approached in *Vaupel 135*. By matching intangible foliage characters of staminate and sterile specimens with the fruiting collections we have grouped the available material into two taxa, but without much conviction that species are represented. Staminate flowers are quite uniform throughout, as are styler characters; the petiole seems totally variable in length and diameter and probably reflects conditions of age or habitat.

3. *Meryta macrophylla* (Rich ex A. Gray) Seem. in *Bonplandia* 10: 294. 1862, *Fl. Vit.* 119. 1865; Drake, *Ill. Fl. Ins. Mar. Pac.* 182. 1890; Hemsl. in *Jour. Linn. Soc. Bot.* 30: 180. 1894; Burkill in *Jour. Linn. Soc. Bot.* 35: 40. 1901; Christophersen in *Bishop Mus. Bull.* 128: 163. 1935; Yuncker in *Bishop Mus. Bull.* 220: 206. 1959.

Botryodendrum macrophyllum Rich ex A. Gray, *Bot. U.S. Expl. Exped.* 1: 732. 1854, *Atlas pl.* 97. 1857.

A redescription of this species should await a detailed revision of the genus; hopefully a specialist will reach a satisfactory conclusion as to the limits of taxa in Samoa and Tonga.

TYPE LOCALITY: Samoa, without definite locality; the U.S. Exploring Expedition specimen cited below is the type.

DISTRIBUTION. Samoa (known definitely from Upolu and Tutuila) and Tonga, where it occurs in forest at elevations from near sea-level to 700 m. and has been noted as a tree 2.5–8 m. high.

LOCAL NAMES. *Fagu fagu* is the general name in Samoa and *kulukulu* in Tonga; further notations indicate *leva va'u* (Upolu), *lau fagu fagu* (Tutuila), and *kulukuluja* (Vava'u).

Samoa. UPOLU: Malololelei, *Christophersen 304* (BISH), *Setchell 15667* (BISH); above Malololelei, *Christophersen 236* (BISH); Vaea Mt., *Bryan 99* (BISH). TUTUILA: Pago Pago and vicinity, *Christophersen 1253* (BISH), *1254* (BISH), *Garber 929* (BISH); Alava Ridge, *Christophersen 1130* (BISH, US); Papatele Ridge, *Christophersen 1006* (BISH, US). SAMOA, WITHOUT FURTHER LOCALITY: *U.S. Expl. Exped.* (GH, US 62360 & 73912 type).

Tonga. VAVA'U: Northwestern side of island, *Yuncker 16181* (BISH, GH, US); Talau hill, *MacDaniels 1095* (BISH); above Anovai Lake, *Yuncker 16050* (BISH, GH, US). EUA: Above Fuai, *Yuncker 15688* (BISH, US).

As an example of the difficulty of specific delimitation in *Meryta* one may note that Harms (in *Notizbl. Bot. Gart. Berlin 14: 320*. 1938) has referred a collection from the Tuamotus to *M. macrophylla*. In spite of a similarity in fruit, this particular specimen (*St. John 14263*, BISH, from Anaa) has leaf-blades rounded at the apex, and we confidently exclude it from the species of Samoa and Tonga.

4. *Meryta denhamii* Seem. in *Bonplandia 10: 295*. 1862; Harms in *Notizbl. Bot. Gart. Berlin 14: 318*. 1938.

Meryta denhami Seem. *Fl. Vit.* 119. 1865; Hemsl. in *Bot. Mag.* 129: *pl.* 7927. 1903.

As we have not seen material of this species, we cannot add to the above-cited descriptions.

TYPE LOCALITY: New Caledonia: Isle of Pines; the type is from a specimen cultivated at Kew, grown from material obtained by W. G. Milne on Captain Denham's Expedition.

DISTRIBUTION. In addition to the Isle of Pines, the species is attributed by Hemsley (as cited above) to the Banks Islands, New Hebrides, by the statement that ". . . what appears to be the same species has since been collected by Archdeacon Comins. . ." on Santa Maria (i.e. Gaua Island).

The species is listed merely because of Hemsley's note, but its occurrence in the New Hebrides is certainly open to question without re-study of the material and the several species attributed to New Caledonia. The excellent figure cited above clearly indicates the nature of the pistillate plant, which at any rate seems quite distinct from *M. neo-ebudica*, the only species of the genus positively recorded from the New Hebrides to date.

3. *Polyscias* J. R. & G. Forst. *Char. Gen. Pl.* 63. 1776; Seem. in *Jour. Bot.* 3: 179. 1865; Harms in *E. & P. Nat. Pflanzenfam.* 3(8): 43. 1894, in *Bot. Jahrb.* 56: 409. 1921; Hutchinson, *Gen. Fl. Pl.* 2: 75. 1967.

Nothopanax Miq. in *Bonplandia 4: 139*. May, 1856, *Fl. Ind. Bat.* 1(1): 765.

Sept. 1856; Seem. Fl. Vit. 113. 1865, in Jour. Bot. 4: 293, p. p. 1866. Non sensu Harms in E. & P. Nat. Pflanzenfam. 3(8): 47. 1894, nec Hutchinson, Gen. Fl. Pl. 2: 76. 1967.

In view of diverse concepts of the delimitation of the genera *Polyscias* and *Nothopanax*, it may be well once again to summarize their typification. *Polyscias*, being based entirely on *P. pinnata* J. R. & G. Forst., presents no problem; its type species has pinnately compound leaves (rarely unifoliate) and 4 or 5 styles, as understood by the Forsters. Only three species may be considered as typifying *Nothopanax* in Miquel's original sense. These are *N. fruticosum* (based on *Panax fruticosum* L.)², *N. cochleatum* (based on *Aralia cochleata* Lam.), and *N. obtusum* (based on *Panax obtusum* Bl.). Two other species (based on *Panax pinnatum* Lam. and *Panax anisum* DC.) were tentatively referred here, prefaced by interrogation marks, and these may be dismissed from consideration as type species.

In his original circumscription of the genus Miquel stated that the styles and ovary-locules were two or three. The only one of the original three species of which the flowers were definitely known to Miquel was *Nothopanax fruticosum*, and it would thus appear imperative to accept that as his type species (cf. Merr. in Philip. Jour. Sci. Bot. 12: 241. 1912). However, Sprague and Green (in Kew Bull. 1933: 155. 1933) indicated *N. cochleatum* as Miquel's type species, and in this they have been followed by Fosberg (in Univ. Haw. Occ. Pap. 46: 9. 1948), Hutchinson (Gen. Fl. Pl. 2: 76. 1967), and doubtless by other authors.

A misinterpretation of the identity of *Nothopanax cochleatum* Miq. (i.e. *Aralia cochleata* Lam.) has been responsible for the use of the name *Nothopanax* for certain species with digitately compound leaves. These species, as convincingly shown by Philipson (in New Zeal. Jour. Bot. 3: 333. 1965), should be placed in *Pseudopanax* C. Koch, which appears to have a distribution from China to Tasmania, New Zealand, New Caledonia, and to southern South America. The persistent error of including digitate-leaved species in *Nothopanax* may have originated with Seemann (in Jour. Bot. 4: 293-296. 1866) and been continued by Harms (in E. & P. Nat. Pflanzenfam. 3(8): 47. 1894), but it is unfortunate that Hutchinson (Gen. Fl. Pl. 2: 76. 1967) prolongs it and even attributes the generic name to Seemann.

As a matter of fact, indication of *N. cochleatum* as the type species of *Nothopanax*, even if it were acceptable, would not permit confusion of that genus and *Pseudopanax*. *Aralia cochleata* Lam. is based entirely on *Scutellaria prima* Rumph., as pointed out by Merrill (Interpret. Rumph. Herb. Amb. 409. 1917), and hence is a direct synonym of *Polyscias scutellaria* (Burm. f.) Fosberg. Below we point out the specific identity of this concept with *P. pinnata*, the type species of *Polyscias*. Therefore, those who wish to follow Sprague and Green in the typification of *Nothopanax* must equate the genus directly with *Polyscias*.

²We use the neuter termination for these epithets only to retain the usage of original authors in this discussion, although the correct usage is masculine.

Acceptance of *Panax fruticosum* L. as the type species of *Nothopanax* Miq. does raise the question of whether a real discontinuity exists between the species of this complex with 2 (rarely 3) styles and ovary-locules (*Nothopanax*) and those species with 3–5 (rarely 2) styles and ovary-locules (*Polyscias*). That this character is highly unsatisfactory has been indicated by the second author (in *Taxon* 14: 284. 1965), and our present study merely supports the conclusion that only one genus is to be maintained, a viewpoint apparently adopted by some other current students of the family (cf. Philipson in *Bull. Brit. Mus. (Nat. Hist.) Bot.* 1: 9. 1951).

Another genus of this relationship is *Tieghemopanax* Viguiier, which Hutchinson (*Gen. Fl. Pl.* 2: 75. 1967) maintains as distinct on the basis of its 4-locular anthers. We are unable to review the New Caledonian and Australian species placed in *Tieghemopanax*, but it seems apparent that the New Hebridean species so referred are properly placed in *Polyscias*, as suggested by the second author in 1965 (in *Taxon* 14: 285) and as indicated in the following treatment. However, we refrain from listing this generic name in the synonymy above.

In the area of the present study, *Polyscias* is represented by 12 species, of which 9 are clearly indigenous and an additional one (*P. scutellaria* including *P. pinnata*) is probably indigenous in the New Hebrides. The species of *Polyscias* yield a characteristic acrid fragrance, especially when the leaves are cut or bruised, this being particularly obvious in such cultivated species as *P. guilfoylei*.

KEY TO THE SPECIES

Leaves once pinnate (sometimes unifoliolate in no. 10).

Styles or stigmas and ovary-locules 2 (very rarely 3); leaves usually with numerous leaflets, only occasionally as few as 7 or 9, very rarely as few as 5; indigenous species.

Flowers borne singly, alternate or loosely whorled on ultimate inflorescence-branches; leaflet-blades not more than 11×5 cm. 1. *P. joskei*.

Flowers in umbels (or pseudo-umbels in no. 9) or heads; leaflet-blades (except in nos. 3 and 4) consistently larger.

Inflorescences paniculately capitate, the flowers sessile; leaflets up to 27×8 cm., strongly asymmetric and cordate at base. 2. *P. nusedhul*.

Inflorescences racemose-paniculate, the flowers pedicellate, in umbels (but pedicels sometimes very short in nos. 7 and 9).

Petioles slightly swollen at base but not alate; leaflet-blades asymmetric, obviously falcate, usually $4-9 \times 1.8-3.5$ cm., unequally acute to rounded at base; young vegetative parts and inflorescence-axes with a sparse (and sometimes evanescent) indument of minute 1-several-celled hairs.

Leaflets (5-) 9–13, the blades coarsely crenulate at margin; petioles 8–14 cm. long on mature leaves; flowers usually 5–12 per umbel, the stylopodium conical, tapering into the slender styler column. 3. *P. neo-ebudarum*.

- Leaflets 19–23, the blades entire at margin; petioles 5–9 cm. long on mature leaves; flowers usually 11–32 per umbel, the disk concave, the styler column slender. 4. *P. culminicola*.
- Petioles alate at base, the wings often obvious; leaflet-blades conspicuously larger, usually much more than 9×4 cm. (basal ones occasionally smaller); plants glabrous throughout.
- Leaflet-blades ovate-falciform, cordate-auriculate at base. 5. *P. excelsa*.
- Leaflet-blades not falcate, subequally obtuse to rounded or subcordate (but not auriculate) at base.
- Disk concave to slightly elevated, the styles obvious, divaricate in fruit, 1–1.5 mm. long.
- Ultimate (umbelliferous) inflorescence-branches very numerous, scattered, irregularly arranged; pedicels comparatively short, not more than 6 mm. long; flowers with a cupuliform calyx not more than 2.5 mm. long.
- Petioles inconspicuously alate in the proximal 3–5 cm.; inflorescence-axes griseo-corticate-lenticellate; flowers borne in umbels on ultimate peduncles 10–20 mm. long, 5–15 per umbel, the pedicels 2–6 mm. long. 6. *P. corticata*.
- Petioles obviously alate in the proximal 7–20 cm.; inflorescence-axes smooth, dark; flowers borne in umbels on ultimate peduncles 1–6 mm. long (or umbels sessile), (1–) 2–7 per umbel, the pedicels less than 1 mm. long. 7. *P. multijuga*.
- Ultimate (umbelliferous) inflorescence-branches often aggregated in loose whorls at 2–4 nodes; flowers borne in umbels on ultimate peduncles 12–80 mm. long, 8–15 per umbel, the pedicels conspicuous, 7–15 mm. long (up to 25 mm. in fruit); flowers comparatively long and narrow, the calyx of perfect flowers urceolate, 3–3.5 mm. long. 8. *P. samoensis*.
- Disk elevated into a broadly conical stylopodium surmounted by two sessile laterally contiguous stigmas, the fruits similarly lacking styles; pedicels short, (0.5–) 1–5 mm. long. 9. *P. reineckeii*.
- Styles and ovary-locules 3–5 (rarely 2); leaves with 1–9 leaflets; cultivated species (no. 10 probably indigenous in the New Hebrides).
- Leaflets 1–5, the blades broadly elliptic or orbicular, usually 8–22 cm. long and broad, cordate or broadly concave (rarely truncate) at base, rounded at apex, entire or coarsely crenulate at margin. 10. *P. scutellaria*.
- Leaflets 5–9, the blades usually elliptic to oblong, usually $6-12 \times 4-8$ cm. (sometimes larger), obtuse to acute at base and apex, irregularly spinulose-dentate at margin. 11. *P. guilfoylei*.
- Leaves irregularly pinnate-compound, usually 2 or 3 times divided but rarely simply pinnate (and then with some leaflets pinnatifid or lacinate); cultivated species.
- Styles and ovary-locules 3–5; leaflets very variable in shape, some usually elliptic to oblong, the marginal teeth usually 1–3 mm. long. 11b. *P. guilfoylei* var. *laciniata*.

Styles and ovary-locules 2 (rarely 3); ultimate leaflet-divisions usually lanceolate and 3–6 times as long as broad, the marginal teeth irregular, some of them usually 5–10 mm. long. 12. *P. fruticosa*.

1. *Polyscias joskei* Gibbs in Jour. Linn. Soc. Bot. 39: 148. 1909; J. W. Parham, Pl. Fiji Isl. 86. 1964. PL. I, FIGS. 1–5.

Botryopanax joskei Hutchinson, Gen. Fl. Pl. 2: 57. 1967.

A tree, glabrous throughout, the branchlets stout (10–15 mm. in diameter toward apices), copiously cicatricose with large obdeltoid petiolar scars, the leaves and inflorescences congested toward ends of branchlets; leaves imparipinnate, up to 60 × 25 cm., the petiole and rachis comparatively slender, shallowly canaliculate, the petiole 10–18 cm. long on mature leaves, slightly swollen at base, the rachis inconspicuously contracted at bases of petiolules, the leaflets 7–15, the petiolules slender, (2–) 5–20 mm. long, the blades chartaceous to thin-coriaceous, ovate- to elliptic-oblong, 5–11 cm. long, (2–) 3–5 cm. broad (basal ones somewhat shorter and broader than middle ones), unequally obtuse to rounded at base, obtuse to short-acuminate at apex, crenulate at margin, the costa raised on both surfaces, the secondary nerves 8–18 per side, subspreading, usually prominulous on both surfaces, the veinlet-reticulation inconspicuous; inflorescences broadly compound-racemose-paniculate, up to 20 cm. long and 40 cm. broad, the peduncle less than 3 cm. long, the primary branches about 8–12, alternate to subopposite or whorled, each bearing numerous secondary branches 3–8 cm. long, the bracts soon caducous; flowers borne singly, alternate or loosely whorled, subtended by lanceolate-subulate bracteoles 0.8–1.2 mm. long, these soon caducous, the pedicels slender, articulate at apex, scarcely 1 mm. long (or flowers subsessile) at anthesis, about 2 mm. long in fruit; staminate flowers about 3 mm. long at anthesis, the calyx conspicuously stipitate at base, cupuliform distally, about 1 mm. in diameter, obscurely (4- or) 5-lobed; petals (4 or) 5, oblong, 2–2.5 mm. long, unguiculate at apex; stamens (4 or) 5, the filaments slender, about 0.6 mm. long, the anthers oblong, 1.5–1.7 mm. long, versatile; stigmas 2, contiguous, forming a minute conical protuberance on the flat disk; perfect flowers not seen; fruits laterally compressed, bilocular, transversely oblong-ellipsoid, 4–5 mm. long, 5–6 mm. broad, surmounted by the persistent calycular rim and 2 conspicuously divergent styles, these about 1.5 mm. long, the stigmas long-decurrent.

TYPE LOCALITY: Nandarivatu, Mba Province, Viti Levu, Fiji; the type is *Gibbs 748*, cited below. Curiously, this number is not cited by Gibbs, although the label notes of the British Museum specimen agree with the data given in the type description, and although the specimen is labelled by Gibbs and bears a printed label "type specimen." The numbers cited in the description are 893 (staminate) and 750 (fruit). We conclude that these specimens were combined and assigned a new number, 748; this sheet

has both flowering and fruiting branchlets and may be indicated as the holotype.

DISTRIBUTION. Endemic to Fiji, and thus far known from Viti Levu, Ovalau, and Vanua Levu, occurring infrequently at elevations of 575–1,150 meters in forest or in the dense thickets of ridges and crests. It has been noted as a tree 3–10 meters high, often compact, with a thin, pale latex. The distal parts of inflorescence-branches and pedicels are purple, the petals are yellow, and the fruits are purple with yellow styles.

LOCAL NAMES. *Sole yalewa* and *nausasa* have been noted on Viti Levu, and *ndanindani* on Vanua Levu.

Fiji. VITI LEVU: MBA: Mt. Evans Range, *Greenwood 1249* (A, BISH, UC, US); Nandarivatu, *Gibbs 748* (BM type, photo at US), *Degener & Ordonez 13578* (A, BISH, SUVA); slopes of Mt. Nanggaranambuluta, *Gillespie 3197* (BISH, GH, NY, US), *3914* (BISH); ridge between Mt. Nanggaranambuluta and Mt. Namama, *Smith 4975* (A, BISH, K, NY, US); between Nandala and Nukunuku Creeks, along trail from Nandarivatu toward Lewa, *Smith 6161* (A, BISH, US). NAMOSI: Summit of Mt. Naitarandamu, *Gillespie 3151* (BISH, GH, UC, US); Mt. Voma, *Fiji Dept. Agr. 1703* (A, SUVA). RA: Ridge from Mt. Namama toward Mt. Tomani, *Smith 5685* (A, BISH, K, NY, US). OVALAU: Summit of Mt. Ndelaiovalau and adjacent ridge, *Smith 7584* (BISH, US). VANUA LEVU: MATHUATA-THAKAUNDROVE BOUNDARY: Crest of Korotini Range, between Navitho Pass and Mt. Ndelaikoro, *Smith 568* (BISH, GH, K, NY, UC, US).

Polyscias joskei is clearly different from the other species of our area in having its flowers borne singly on the ultimate inflorescence-branches rather than in umbels. It may be noted, however, that *P. multijuga* and *P. reineckeii* sometimes have a reduced number of flowers per umbel and rarely only one, but there the single-flowered condition is sporadic and never consistent for an entire inflorescence. The other characters of these two species are strikingly different, but the point noted above may suggest the flexibility of the single-flowered condition.

A closer relative of *P. joskei* may be *P. tahitensis* (Nad.) Harms, of the Society Islands, but the leaflet-blades of the latter are oblong-lanceolate, proportionately narrower, and entire. The flowers of *P. tahitensis* appear to be borne in compact, few-flowered umbels; when these are one-flowered, the appearance of racemosely borne flowers is simulated.

In his 1967 review of the family, Hutchinson has proposed a new combination for *P. joskei* in the genus *Botryopanax* Miq., unaccountably accrediting our species to the Philippine Islands, even though the generic distribution of *Botryopanax* is stated as Mauritius and the Mascarenes. We cannot express an opinion as to the limits of *Botryopanax*, but, since it is stated to have 13–16 petals and 8–12 ovary-locules, the reference to it of a species with 5 petals and 2 ovary-locules is in error. If those species of *Polyscias* with solitary (rather than umbellate) flowers are to be segregated, Hutchinson's new genus *Gelibia* (in *Gen. Fl. Pl.* 2: 57. 1967) seems better suited for them, whether the leaves are simply pinnate or bipinnate seeming of little consequence. Since *Polyscias* includes at least one species with decomposed leaves (*P. fruticosa*), the two species of *Gelibia* are

hardly separable on that basis. Actually, it is quite evident that *P. joskei* in all its basic characters is well placed in *Polyscias*, and transitional stages between single flowers and few-flowered umbels are apparent in the genus, as noted above.

2. *Polyscias nusedhul* (Guillaumin) B. C. Stone in *Taxon* 14: 285. 1965.

Tieghemopanax nusedhul Guillaumin in *Jour. Linn. Soc. Bot.* 51: 554. 1938.

Having seen no material of this species, we cannot add to the original description.

TYPE LOCALITY: Hog harbour, Espiritu Santo, New Hebrides; two specimens, *I. & Z. Baker 13a* and *71a*, are cited without designation of a type. These cotypes are deposited in the herbarium of the British Museum.

LOCAL NAME. *Nüsedhul* is apparently used generically in this part of the New Hebrides, since it was also recorded for the species we discuss as *P. excelsa*.

On the basis of the description one may feel sure that a species of *Polyscias* is here concerned; Guillaumin's concept of *Tieghemopanax* includes *T. neo-ebudarum*, which is discussed as our next species of *Polyscias*, as well as *T. fruticosus*, a synonym of *P. fruticosa*. The description indicates that *P. nusedhul* is related to the common and variable *P. multijuga*, of Fiji, Tonga, and Niue, but the New Hebridean plant would appear to have more obviously inequilateral leaflets that are consistently cordate at base, shorter petiolules, a less expansive inflorescence, and strictly sessile flowers about 10 per head. The flowers of *P. multijuga* are 2–7 per umbel (rarely solitary) and short-pedicellate (but rarely essentially sessile).

3. *Polyscias neo-ebudarum* (Guillaumin) B. C. Stone in *Taxon* 14: 285, as *P. neo-ebudara*. 1965. PL. I, FIGS. 6–8.

Tieghemopanax neo-ebudarum Guillaumin in *Jour. Arnold Arb.* 12: 264. 1931.

A tree, glabrous throughout or the young parts and inflorescence-axes with a sparse indument of 1–3-celled spreading hairs scarcely 0.1 mm. long and evanescent, the branchlets 6–8 mm. in diameter toward apices; leaves imparipinnate, up to 40 cm. long, the petiole and rachis slender, subterete, the petiole 8–14 cm. long on mature leaves, slightly swollen at base, the rachis obscurely contracted at bases of petiolules, the leaflets (5–) 9–13, the petiolules slender, 5–10 mm. long, the blades papyraceous, asymmetric and subfalcate (lateral ones), ovate-lanceolate, 4–9 cm. long, 1.8–3.5 cm. broad, unequally acute at base, acute to obtusely acuminate at apex, coarsely crenulate at margin, the costa raised on both surfaces, the secondary nerves 5–8 per side, subascending, prominulous or plane on both surfaces, the veinlets usually obscure; inflorescences racemose-paniculate, up to 30 cm. long, the peduncle very short, the primary branches

few, subscending, the bracts small, caducous; flowers borne in umbels on ultimate peduncles 2–10 mm. long, usually 5–12 per umbel, the flower-subtending bracteoles lanceolate, about 0.5 mm. long, evanescent, the pedicels 1–4 mm. long, articulate at apex; perfect flowers with a narrowly cupuliform calyx about 2 mm. long, the teeth minute (calyx of staminate flowers stipitate at base and smaller); petals 5, oblong, 3–3.5 mm. long, unguiculate at apex; stamens 5, the filaments slender, 1.5–1.7 mm. long, the anthers ovate-oblong, about 2 mm. long, versatile; stylopodium conical, about 2 mm. long including the slender styler column, this minutely bifid at apex; fruits laterally compressed, bilocular, transversely oblong-ellipsoid, 3–4 mm. long, 4–4.5 mm. broad, surmounted by the narrow calycular rim and the styler column 0.8–1 mm. long, this bifid at apex with 2 stigmatiferous lobes less than 0.5 mm. long.

TYPE LOCALITY: New Hebrides. Three specimens were cited by Guillaumin without indication of a type, and therefore we herewith indicate *Kajewski 291*, from Eromanga, as the lectotype; the holotype is presumably the specimen in the herbarium of the Arnold Arboretum.

DISTRIBUTION. Endemic to the New Hebrides, and thus far known from Eromanga and Aneityum, where it is indicated as relatively common in rain-forest at elevations of 60–600 meters. Specimens were taken from trees 8–12 meters high; the flowers are noted as purple-brown and the fruit as black at maturity.

LOCAL NAMES AND USES. *Narse* has been noted on Eromanga, and *kiviano* on Aneityum; on the former island the leaves are used as an application for sore ears.

New Hebrides. EROMANGA: Dillon Bay, May 23, 1928, *Kajewski 291* (A type, BISH). ANEITYUM: Anelgauhat Bay, *Kajewski 749* (A, BISH, US), 977 (coll. J. P. Wilson) (A, BISH, US).

This species clearly falls into our concept of *Polyscias*, in which genus it is closely related only to the Fijian *P. culminicola*.

4. *Polyscias culminicola* A. C. Sm. in Contr. U.S. Natl. Herb. 37: 85. 1967. PL. I, FIGS. 9–12.

Although no material additional to the type collection is available, examination of isotypes permit a slight amplification of the description.

Plant apparently polygamo-monoecious, the central flowers of umbels sometimes perfect or functionally pistillate (self-fertile?), the ovary enlarging before the corolla opens; immature fruit 2-locular, compressed-oblong-ellipsoid, up to 7×5.5 mm.; outer (or sometimes all) flowers of umbels staminate, as originally described.

TYPE LOCALITY: Mba Province, Viti Levu, Fiji; the type is *Smith 4514*, cited below.

DISTRIBUTION. Endemic to Fiji, and thus far known from a single locality in western Viti Levu, where it was found in crest forest on a wind-swept ridge at an elevation of 750–900 meters. The material is from a tree

8 meters high, with leaves tufted at ends of branchlets and with the inflorescence terminal on branchlets.

LOCAL NAME. *Sawira* was recorded for the type collection, but this usually refers to the family Meliaceae and may be incorrectly applied to a *Polyscias*.

Fiji. VITI LEVU: MBA: Northern slopes of Mt. Namendre, east of Mt. Koromba (Pickering Peak), *Smith 4514* (A, BISH, K, US 1965344 type).

Polyscias culminicola is less closely related to *P. joskei*, with which it was originally compared, than to the New Hebridean *P. neo-ebudarium*, with which it agrees in its umbellate flowers, its comparatively small, falcate leaflets, the indument of its young vegetative parts and inflorescence-axes (although this is evanescent in *P. neo-ebudarium*), and its petioles lacking the basal wings so characteristic of most species of *Polyscias* (but also lacking in *P. joskei*). Foliar and inflorescence characters noted in our key clearly differentiate *P. culminicola* and *P. neo-ebudarium*.

5. *Polyscias excelsa* (Guillaumin) B. C. Stone in *Taxon* 14: 285. 1965.

Tieghemopanax excelsa Guillaumin in *Jour. Linn. Soc. Bot.* 51: 554. 1938.

As we have not seen material of this species, we cannot add to the original description; however, in view of the other dimensions given it seems probable that “. . . floribus . . . 30 mm. longis” is an error for 3 mm.

TYPE LOCALITY: Hog harbour, Espiritu Santo, New Hebrides; the type is *I. & Z. Baker 13*, deposited in the herbarium of the British Museum.

LOCAL NAME. *Nüsedhul* is recorded with the original description.

It may be noted that one of the Baker numbers referred to *P. nusedhul* is *13a*, collected at the same locality as no. *13* but on a different date. On the basis of the descriptions, the two species are amply distinct and are both clearly referable to *Polyscias*. *Polyscias excelsa* also would appear to be of the relationship of *P. multijuga*, with which it agrees in its large inflorescences and few-flowered, compactly arranged umbels. The flowers of *P. excelsa* are noted as 6–10 per umbel, whereas in the Fijian species they are 2–7 or sometimes single. The ovate-falciform, cordate-auriculate leaflet-blades, from the description, seem to provide a further differentiating character for *P. excelsa*.

6. *Polyscias corticata* Gibbs in *Jour. Linn. Soc. Bot.* 39: 149. *pl.* 13, *figs.* 14–17. 1909; J. W. Parham, *Pl. Fiji Isl.* 86. 1964.

PL. II, FIGS. 10–14.

A tree or shrub, glabrous throughout; leaves imparipinnate, large, up to 100 cm. long, the petiole and rachis comparatively stout, subterete or obscurely canaliculate, the petiole of mature leaves 20–35 cm. long, conspicuously swollen to a clasping, lenticellate base and inconspicuously alate in the proximal 3–5 cm., the rachis geniculate at bases of petiolules,

the leaflets (9-) 13-17, the petiolules slender, diverse in length, of lateral leaflets 2-25 mm. and of terminal leaflet to 45 mm. long, the blades papyraceous, oblong or ovate-elliptic, (9-) 15-30 cm. long, (4-) 6-10 cm. broad, subequally obtuse to rounded or subcordate at base, abruptly caudate-acuminate at apex (acumen 1-2.5 cm. long but fragile), entire or with a few callose-denticulate crenations, the costa sharply raised above, prominent beneath, the secondary nerves 8-18 per side, spreading, usually plane above and prominulous beneath, the veinlet-reticulation coarse, prominulous beneath; inflorescences racemose-paniculate, up to at least 50 cm. long, the primary branches diverse in length, up to 40 cm. long, all the inflorescence-axes griseo-corticate-lenticellate, the primary bracts oblong-lanceolate, 1-2 cm. long (those at base of inflorescence to 4 cm. long), at length caducous, the umbel- and flower-subtending bracts and bracteoles oblong, 1-3 mm. long; flowers borne in umbels on ultimate peduncles 10-20 mm. long, usually 5-15 per umbel, the pedicels 2-6 mm. long, articulate at apex; perfect flowers 5-6 mm. long at anthesis, with a cupuliform calyx 2-2.5 mm. long, the rim undulate or obscurely 5-denticulate; petals 5, deltoid-oblong, 2.5-3.5 mm. long, unguiculate at apex; stamens 5, the filaments slender, about 1 mm. long, the anthers oblong, 1.5-2 mm. long; disk concave or flat, the styles 2, free nearly to base, erect or subspreading, 1-1.5 mm. long, with decurrent stigmas; staminate flowers similar but somewhat smaller; fruits laterally compressed, bilocular, transversely ellipsoid, about 4×6.5 mm., substipitate at base, surmounted by the persistent calycular rim and the obviously divaricate styles.

TYPE LOCALITY: Mba Province, Viti Levu, Fiji; the type is *Gibbs 769*, cited below.

DISTRIBUTION. Endemic to Fiji, and thus far known from the largest islands, Viti Levu and Vanua Levu, where it occurs in usually dense forest at elevations of 300-900 meters. Specimens have been indicated as slender trees or shrubs, unbranched or few-branched, and 1.5-4 meters high; the inflorescences are axillary among leaves congested toward apices of branchlets. The calyx is purplish or reddish; the petals green to white, but becoming rich purple without at anthesis; the anthers pale yellow to white; and the styles yellowish.

LOCAL NAMES. *Sole* and *ndravi* have been noted on Viti Levu, and *ndanindani* on Vanua Levu.

Fiji. VITI LEVU: MBA: Nandarivatu and vicinity, *Gibbs 769* (BM type, photo at US), *Degener 14458* (A, BISH, K, NY, UC, US), *14806* (A, BISH, K, NY, UC, US), *14834* (A, BISH, K, NY, UC, US); between Nggaliwana and Nandala Creeks, south of Nauwanga, *Smith 5804* (A, BISH, K, NY, US). VANUA LEVU: THAKAUNDOVE: Southern slopes of Korotini Range, below Navitho Pass, *Smith 510* (BISH, NY); southwestern slope of Mt. Mbatini, *Smith 611* (BISH, GH, K, NY, UC, US).

The Fijian *P. corticata* and *P. multijuga* and the Samoan *P. samoensis* form a group of related species, but differences among them are obvious. *Polyscias corticata* is readily distinguished by having its inflorescence-axes

pale and with congested transverse lenticels that provide a curiously flaky appearance. In type of inflorescence *P. corticata* is closer to *P. multijuga* than to *P. samoensis*, but in length of pedicels and of umbel-peduncle it is intermediate between them. The petiolar wings of *P. corticata* are less conspicuous than in either of its two relatives.

7. *Polyscias multijuga* (A. Gray) Harms in E. & P. Nat. Pflanzenfam. 3(8): 45. 1894; Yuncker in Bishop Mus. Bull. 178: 92. 1943, in *op. cit.* 220: 207. 1959. PL. II, FIGS. 1-9.

Paratropia multijuga A. Gray, Bot. U.S. Expl. Exped. 1: 722. 1854.

Nothopanax multijugum Seem. Fl. Vit. 115. pl. 18, 19. 1865, in Jour. Bot. 4: 295. 1866.

Panax multijugus B. & H. f. Gen. Pl. 1: 938. 1867.

Panax multijugum B. & H. f. ex Drake, Ill. Fl. Ins. Mar. Pac. 181. 1890; Hemsl. in Jour. Linn. Soc. Bot. 30: 180. 1894.

A tree, glabrous throughout; leaves imparipinnate, large, up to 100 cm. long, the petiole and rachis stout, subterete or slightly flattened above, the petiole of mature leaves 10-35 cm. long, conspicuously swollen to a clasping, often lenticellate base and obviously alate in the proximal 7-20 cm. with subcoriaceous wings, the rachis geniculate at bases of petiolules, the leaflets 13-25 (-29), the petiolules stout, diverse in length, of lateral leaflets 5-50 and of terminal leaflet to 60 mm. long, the blades papyraceous to thin-coriaceous, variable in size and shape, oblong to oblong- or ovate-elliptic, (9-) 12-27 cm. long, (3-) 4-12.5 cm. broad, subequally cordate to rounded or obtuse at base, subacute to cuspidate or acuminate at apex (acumen to 1.5 cm. long), entire and narrowly recurved at margin, the costa sharply raised above, prominent beneath, the secondary nerves 6-18 per side, spreading, prominulous on both surfaces or plane above, the veinlets usually plane on both surfaces; inflorescences compound-racemose-paniculate, up to 150 cm. long, composed of 3-8 panicles arising from a stout central rachis, the primary branches stout, bearing numerous irregularly disposed (alternate or opposite or whorled) secondary branches 5-18 cm. long at maturity, the primary bracts often subcoriaceous, ovate-oblong, 4-20 mm. long, obtuse or acute, the umbel- and flower-subtending bracts and bracteoles 0.5-2 mm. long; flowers borne in umbels on very short ultimate peduncles 1-6 mm. long (or umbels essentially sessile), (1-) 2-7 per umbel, the pedicels 0.5-1 mm. long (or flowers sometimes essentially sessile); perfect (or functionally pistillate) and staminate flowers sometimes occurring in the same umbel, differing only in the slightly smaller calyx of the latter; perfect flowers with a cupuliform calyx 1-1.3 mm. long, the rim undulate or obscurely 5-denticulate; petals 5, oblong-ovate, 2-3 mm. long, unguiculate at apex; stamens 5, the filaments slender, minute, the anthers oblong, 0.8-1.2 mm. long; disk slightly concave, the styles 2 (rarely 3?), suberect and contiguous in flower, usually 1-1.5 mm. long, divergent at least distally in fruit, with decurrent stigmas; fruits laterally compressed, bilocular (rarely trilocular ex Seemann),

transversely ellipsoid, up to 5.5×6 mm., surmounted by the persistent calycular rim and styles, shallowly costate when dried.

TYPE LOCALITY: Mbua Bay ("Sandalwood Bay"), Mbua Province, Vanua Levu, Fiji; the type is the U.S. Exploring Expedition specimen cited below.

DISTRIBUTION. Fiji, Tonga, and Niue, occurring very abundantly at least in Fiji at elevations from near sea-level to 1,100 meters, and reported as a component of many types of forest or second-growth habitats. Specimens have been obtained from trees 2–15 meters high, usually noted as slender, sometimes unbranched, and with trunks up to 20 centimeters in diameter; the inflorescence is terminally borne on branchlets with a cluster of leaves. Color notes indicate the buds to be dark red, the petals and stamens greenish white to pale yellow, and the fruit purple at maturity.

LOCAL NAMES. In Fiji the names *ndanindani* and *sole* are general for this species (and other araliaceous plants); other names noted on Viti Levu are *sole ngga*, *sole katangane*, and *rau-i-tolu*, and in the Yasawas *wala nimberngua*. In Tonga the names *tanetane* and *kulukulu* have been recorded, and on Niue *tanetane* and *tanetane vao*.

Fiji (because of abundance only island and province are cited). YASAWAS: WAYA: *St. John* 18104 (BISH, US). VITI LEVU: MBA: *Parks* 20532 (BISH, UC), *Gillespie* 4295 (BISH), *Greenwood* 297 (K), 297a (A, UC), 935 (A, BISH), *Smith* 4065 (A, BISH, K, US), 4837 (A, BISH, US). NANDRONGA & NAVOSA: *Degener* 15264 (A, BISH, K, NY, UC, US), *Smith* 5480 (A, BISH, K, NY, US). SERUA: *Degener* 15137 (A, BISH, K, NY, UC, US), *Smith* 9178 (BISH, US), *Fiji Dept. Agr.* 12453 (BISH, SUVA). NAMOSI: *Seemann* 205 (BM, GH, K), *Gillespie* 2860 (BISH, UC), 2898 (BISH), 3120 (BISH, GH, UC) *Smith* 8509 (BISH, US), *Fiji Dept. Agr.* 5902 (SUVA). RA: *Degener* 15499 (A, BISH, K, NY, UC, US). NAITASIRI: *Gillespie* 3428 (BISH, GH, UC), *St. John* 18246 (BISH, US), *Fiji Dept. Agr.* 10640 (SUVA). REWA: *Gillespie* 2210 (BISH, GH, NY). KANDAVU: *Smith* 122 (BISH, GH, K, NY, UC, US). OVALAU: *Graeffe* (K). KORO: *Smith* 937 (BISH, GH, K, NY, UC, US). NGAU: *Smith* 7743 (BISH, US). VANUA LEVU: MBUA: *U.S. Expl. Exped.* (GH, US 47924 & 47925 type). MATHUATA: *Smith* 6339 (A, BISH, K, NY, US), *Fiji Dept. Agr.* 11498 (SUVA). THAKAUNDOVE: *Smith* 365 (BISH, GH, K, NY, UC, US), *Degener & Ordonez* 14019, 14081, 15545 (all A, BISH, K, NY, UC, US). TAVEUNI: *Gillespie* 4711 (BISH, UC). MOALA: *Bryan* 297 (BISH, UC). VANUA MBALAVU: *Smith* 1497 (BISH, GH, K, NY, UC, US). AIWA: *Bryan* 525 (A, BISH). KAMBARA: *Smith* 1299 (BISH, NY). ONGEA LEVU: *Bryan* 427 (BISH, US). FIJI WITHOUT OTHER LOCALITY: *Harvey* (GH, K), *Horne* 189 (K).

Tonga. TONGATAPU: Near caves of Anahulu, *Setchell & Parks* 15278 (UC); near Hufagalupe, *Setchell & Parks* 15625 (UC); near Kologa Point, *Setchell & Parks* 15385 (BISH, NY, UC); near Houma, *Yuncker* 16227 (BISH, GH, US). 'EUA: *Lister* (K, photos at BISH, US), *Hotta* 5434 (BISH).

Niue: Near Alofi, *Yuncker* 9791 (BISH), 10062 (BISH, UC); near Mutalau, *Yuncker* 9717 (A, BISH).

Polyscias multijuga is one of the most frequent small trees of the Fijian forests, and at one time it was probably equally abundant in Tonga and Niue. It is characterized by large, coarse leaves and inflorescences, of which the umbels are few-flowered and short-pedunculate. The stout

petiole of *P. multijuga* bears obvious, subcoriaceous wings that extend upward from the base 7–20 centimeters.

8. *Polyscias samoensis* (A. Gray) Harms in E. & P. Nat. Pflanzenfam. 3(8): 45. 1894, in Bot. Jahrb. 25: 663. 1898; Rechinger in Denkschr. Akad. Wiss. Wien 85: 323. 1910; Setchell in Carnegie Inst. Publ. 341: 61. 1924; Christophersen in Bishop Mus. Bull. 128: 165. 1935.
PL. I. FIGS. 15–17.

Panax samoense A. Gray, Bot. U.S. Expl. Exped. 1: 717. 1854; Drake, Ill. Fl. Ins. Mar. Pac. 182. 1890.

Nothopanax samoense Seem. Fl. Vit. 116. 1865, in Jour. Bot. 4: 295. 1866; Powell in Jour. Bot. 6: 366. 1868.

A shrub or tree, glabrous throughout; leaves imparipinnate, large, perhaps up to 100 cm. long, the petiole and rachis comparatively slender, subterete, the petiole of mature leaves up to 20 cm. long, swollen to a clasping base and narrowly alate in the proximal 5–8 cm., the rachis geniculate at bases of petiolules, the leaflets 11–17, the petiolules slender, of lateral leaflets 8–30 mm. and of terminal leaflet to 35 mm. long, the blades papyraceous, oblong- to ovate-elliptic, (7–) 9–21 cm. long, 4–8.5 cm. broad, subequally subcordate to rounded or obtuse at base, gradually attenuate to a slender acumen 1–2 cm. long, entire or undulate and recurved at margin, the costa slightly raised above, prominent beneath, the secondary nerves 6–10 per side, curved-ascending, with the intricate veinlet-reticulation prominulous on both surfaces; inflorescences compound-paniculate, ample, up to at least 50 × 25 cm., the axes comparatively slender, the peduncle up to 18 cm. long, the primary branches numerous, spreading, irregularly disposed on the rachis, sometimes alternate but more often aggregated in loose whorls at 2–4 nodes including a terminal one, each primary branch bearing umbels at apex or again divided like the rachis, the primary bracts caducous (presumably small), the umbel- and flower-subtending bracts and bracteoles lanceolate, 1–3 mm. long; flowers borne in umbels on conspicuous slender ultimate peduncles 12–80 mm. long, 8–15 per umbel (sometimes mixed with additional umbels), the pedicels slender, 7–15 mm. long at anthesis and inconspicuously articulate at apex, elongating to 25 mm. in fruit; flowers (apparently uniformly hermaphrodite) slender, 6–7 mm. long at anthesis, the calyx urceolate, 3–3.5 mm. long including the obvious undulate or 5-denticulate rim; petals 5, lanceolate-ovate, 3–3.5 mm. long, unguiculate at apex; stamens 5, the filaments slender, less than 0.5 mm. long, the anthers oblong, 1.5–1.7 mm. long; disk flat, the styles 2, erect and contiguous in flower, spreading nearly from base in fruit and strongly recurved, elongating to 1.5 mm., with decurrent stigmas; fruits laterally compressed, bilocular, suborbicular, 7–8 mm. long and broad, conspicuously nerved, surmounted by the obvious calycular rim and styles.

TYPE LOCALITY: Samoa, indicated as Savaii and Tutuila; the type is the U.S. Exploring Expedition collection cited below.

DISTRIBUTION. Endemic to Samoa, and known from the three largest islands, occurring at elevations up to about 400 meters, presumably in forest. Specimens have been taken from trees or shrubs up to 7 meters high; the flowers and fruits are reported as dark purple in color, and the fruits have conspicuous reddish or purplish veins.

LOCAL NAMES AND USES. *Tanitani* is probably the name in general use, but Setchell notes *afia* as the name on Tutuila and indicates that oil from the plant is used on the hair. It is interesting to note that Powell (in Jour. Bot. 6: 278. 1868) lists *afia* as the name for *Ascarina lanceolata*, but indicates *afia-vao* for an unidentified shrub that, from his brief note, could represent *Polyscias*.

Samoa. "SAVAII AND TUTUILA": U.S. Expl. Exped. (GH, US 47923 type). UPOLU: (No material seen but reported by Harms and Rechinger). TUTUILA: Leone, *Wilder* 87 (BISH); Pago Pago, *Wilder* 44 (or 244) (BISH); above Pago Pago, near wireless station, *Setchell* 255 (coll. *Sutupe*) (GH, UC, US); between Fagaalu and Fatimafutu, *Setchell* 374 (BISH, UC). SAMOA WITHOUT OTHER LOCALITY: *Powell* 21 (K), 36 (K), 47 (K, photos at BISH, US), 159 (K, photos at BISH, US), 265 (K, photos at BISH, US), *s.n.* (K, photos at BISH, US), *Whitmee* 97 (K), 197 (K, photos at BISH, US).

We have also seen a specimen from Aneityum, New Hebrides, obtained by an unknown collector in February 1859 (BM), which suggests this species. However, it is a very incomplete specimen, suggesting *P. samoensis* in its flowers but with smaller and strongly cordate leaflet-blades. It is noted here as a possibly undescribed relative of *P. samoensis*, which may safely be inferred to be a Samoan endemic.

From its relatives, *P. corticata* and *P. multijuga*, *P. samoensis* differs in its much more lax and open inflorescences, of which the comparatively few branches are whorled at a few nodes and umbellately aggregated apically. The flowers, borne on conspicuous pedicels in long-pedunculate umbels, are longer than those of the related species, with a conspicuously urceolate calyx, and the fruits are larger and very conspicuously nerved.

9. *Polyscias reineckeii* Harms in Bot. Jahrb. 25: 663. 1898; Rechinger in Denkschr. Akad. Wiss. Wien 85: 323. 1910; Christophersen, Bishop Mus. Bull. 128: 165. 1935; (?) Yuncker in Bishop Mus. Bull. 184: 56. 1945. PL. III, FIGS. 1-6.

A tree, glabrous throughout; leaves imparipinnate, large, perhaps up to 100 cm. long, the petiole comparatively stout, of mature leaves 15-25 cm. long, swollen to a clasping base and narrowly alate in the proximal 10-14 cm., the rachis more slender, subterete, geniculate at bases of petiolules, the leaflets (9-) 11 or 13, the petiolules slender, of lateral leaflets 5-40 and of terminal leaflet to 60 mm. long, the blades papyraceous, oblong-to ovate-elliptic, (5-) 10-25 cm. long, (3-) 4-11 cm. broad, unequally rounded to obtuse at base, gradually attenuate to a slender sharp acumen 1-2 cm. long, entire or remotely spinulose-denticulate and narrowly recurved at margin, the costa plane or shallowly canaliculate above, prominent beneath, the secondary nerves 7-10 per side, curved-ascending,

prominulous on both surfaces, the veinlet-reticulation intricate, plane or prominulous; inflorescences compound-paniculate, ample, sometimes exceeding 100 cm. in length, composed of a few (2-4?) elongate primary branches arising from a comparatively short peduncle and rachis, the branches pendent, long-pedunculate, each bearing about 6-12 elongate alternate lax secondary branches, the primary bracts lanceolate, 15-30 mm. long, soon caducous, the secondary bracts 3-10 mm. long, the umbel- and flower-subtending bracts and bracteoles 0.5-2 mm. long; flowers borne in (sometimes imperfect) umbels on slender ultimate peduncles (of diverse length) 1-20 (-40) mm. long, (1-) 3-8 per umbel, the pedicels slender, (0.5-) 1-3 mm. long at anthesis and inconspicuously articulate at apex, scarcely elongating (1-5 mm.) in fruit; flowers (apparently uniformly hermaphrodite) 4-4.5 mm. long at anthesis, the calyx cupuliform, 1.5-2 mm. long, the rim short, inconspicuously 5-denticulate; petals 5, deltoid-ovate, 2-3 mm. long, unguiculate at apex; stamens 5, the filaments ligulate, less than 1 mm. long, the anthers oblong, about 1.5 mm. long; stylopodium broadly conical, surmounted by 2 sessile laterally contiguous stigmas; fruits laterally compressed (or triquetrous?), bilocular (sometimes trilocular ex Harms), suborbicular or transversely ellipsoid, 5-6 × 6-8 mm., surmounted by the calycular rim, the stylopodium projecting less than 1 mm. and terminated by strictly sessile stigmas.

TYPE LOCALITY: Letogo Ridge, Upolu, Samoa; the type is *Reinecke 136*, collected in February 1894, and presumably destroyed in the Berlin herbarium.

DISTRIBUTION. Endemic to Samoa, and thus far known definitely only from Savaii and Upolu, where it occurs at elevations of near sea-level to 700 meters in open forest, coastal forest, etc. Plants of the species are reported as trees 4-12 meters high; no color notes are available. Four additional specimens from Upolu were listed by Rechinger in 1910.

LOCAL NAME. *Afia* has been noted on Savaii.

Samoa. SAVAII: Salailua, *Christophersen & Hume 2616* (A, BISH, US); between Salailua and Lataitai, *Christophersen 3010* (A, BISH); between Falelima and Samata, *Christophersen 2764* (A, BISH); Matavanu, near crater, *Christophersen & Hume 1951* (BISH, NY, US); above Sili, *Christophersen 3280* (BISH, US). UPOLU: *Graeffe* (BM).

An additional record of *P. reineckeii*, on the island of Tau, Manua Islands, was noted by Yuncker in 1945, but this record was based on an observation by Paul L. Guest and is not supported by herbarium material. In view of the superficial similarity of this species and *P. samoensis*, the record must be questioned, especially as the latter is known from nearby Tutuila and the former is not.

Although in foliage *P. reineckeii* is not easily distinguished from *P. samoensis*, there are excellent inflorescence-differences between these two Samoan endemics. The primary inflorescence-branches of *P. reineckeii* bear alternate, elongate branches with racemosely disposed umbels, whereas the inflorescence-branches of *P. samoensis* are usually whorled and often

again branched in a pseudo-umbellate manner. In both species the peduncles of the ultimate umbels are very diverse in length, but in *P. reineckeii* they are usually the shorter. The flowers of *P. reineckeii* are uniformly short-pedicellate, the pedicels not exceeding 3 mm. in length at anthesis and 5 mm. in fruit, whereas *P. samoensis* has pedicels 7–25 mm. long. The flowers of *P. samoensis* are notably longer, and the stylar difference is particularly noteworthy, *P. samoensis* having obvious styles strongly recurved in fruit, and *P. reineckeii* having its stigmas sessile on a broadly conical stylopodium even in mature fruit.

It may be noted that in *P. reineckeii* (e. g. in *Christophersen & Hume 2616*) the flowers may sometimes be only pseudo-umbellate, actually racemosely arranged toward the apices of the ultimate peduncles, which are freely bracteolate along much of their length. Thus we have another type of transition between umbellate and individually borne flowers, indicating that this character is not dependable even at the specific level with exactitude, and certainly not at the generic or tribal level.

10. *Polyscias scutellaria* (Burm. f.) Fosberg in Univ. Haw. Occ. Pap. 46: 9. 1948; B. C. Stone in Taxon 14: 284. 1965.

PL. I, FIGS. 13, 14.

Scutellaria prima Rumph. Herb. Amb. 4: 75. pl. 31. 1743.

Crassula scutellaria Burm. f. Fl. Ind. 78. 1768.

Polyscias pinnata J. R. & G. Forst. Char. Gen. Pl. 64. pl. 32. 1776; Forst. f. Fl. Ins. Austr. Prodr. 90. 1786; Seem. in Jour. Bot. 3: 180. 1865; Guillaumin in Bull. Soc. Bot. France 66: 270. 1919; Harms in Bot. Jahrb. 56: 409. 1921; Guillaumin in Bull. Soc. Bot. France 74: 698. 1927, in Bull. Mus. Hist. Nat. II. 9: 289. 1937, in Jour. Linn. Soc. Bot. 51: 554. 1938; B. C. Stone in Taxon 14: 282. 1965.

Aralia cochleata Lam. Encycl. Méth. 1: 224. 1783.

Panax conchifolium Roxb. Hort. Beng. 21, nomen. 1814, Fl. Ind. ed. 2. 2: 77. 1832.

Panax scutellaroides Reinw. in Bl. Bijdr. 880. 1826.

Panax cochleatum DC. Prodr. 4: 253. 1830.

Panax heyneanum Wall. Cat. n. 4927, nomen. 1832; G. Don, Gen. Syst. 3: 385. 1835; Walp. Rep. 2: 429. 1843.

Panax forsteri Dec. & Pl. in Rev. Hort. IV. 3: 105. 1854.

Nothopanax cochleatum Miq. in Bonplandia 4: 139. May, 1856, Fl. Ind. Bat. 1(1): 766. Sept. 1856.

Nothopanax tricochleatum Miq. Fl. Ind. Bat. Suppl. 1: 340. 1861; Merr. Interpret. Rumph. Herb. Amb. 409. 1917.

Panax rumphii Hassk. in Abh. Naturf. Gesellsch. Halle 9: 220. 1866.

Panax pinnata Baill. Hist. Pl. 7: 197. fig. 205. 1879. Non Lam. (1788) nec A. Rich. (1847).

Nothopanax scutellarium Merr. Interpret. Rumph. Herb. Amb. 409. 1917.

Polyscias tricochleata Fosberg in Phytologia 5: 290. 1955.

A shrub or small tree, glabrous throughout; leaves imparipinnate (often unifoliolate), the petiole usually 10–30 cm. long, swollen to a clasping base and narrowly alate in the proximal 1–5 cm., the rachis geniculate at

bases of petiolules (or usually jointed in unifoliolate leaves), the leaflets 1, 3, or 5 (less often 2 or 4), the petiolules slender, of lateral leaflets (0.5–) 1–5 and of terminal leaflet to 6 cm. long, the blades papyraceous to subcoriaceous, normally green but often with white margins or areoles, broadly elliptic or orbicular, usually 8–22 (–26) cm. long and broad (but often smaller in cultivated plants), cordate or broadly concave (rarely truncate) at base, rounded at apex, subentire or coarsely crenulate at margin (crenations 1–2 cm. distant and sometimes conspicuously spinulose, or the leaflets sometimes subpalmately lobed), the costa raised above and prominent beneath, the secondary nerves 5–8 per side, spreading, prominent on both surfaces or prominent beneath, the veinlet-reticulation intricate, plane or slightly prominent on both surfaces; inflorescences compound-paniculate, up to 60 cm. long, the peduncle short, to 3 cm. long, the primary branches numerous, up to 45 cm. long, alternate toward base of inflorescence but often opposite or verticillate distally, the secondary branches similarly arranged, the primary bracts ovate, acute, to 1 cm. long, soon caducous, the umbel- and flower-subtending bracts and bracteoles ovate to lanceolate, 0.5–1.5 mm. long; flowers borne in umbels on slender ultimate peduncles 4–15 mm. long, 8–26 per umbel, the pedicels slender, 1.5–6 mm. long, articulate at apex; flowers 3–3.5 mm. long at anthesis, the calyx cupuliform, 1–1.5 mm. long and about 2 mm. in diameter at anthesis, the rim short, inconspicuously denticulate with 5–8 (rarely 9) teeth; petals 5–7 (sometimes 8, rarely 4 or 9), narrowly ovate-elliptic, 1.8–2.5 mm. long, unguiculate at apex; stamens as many as petals, the filaments slender, 0.5–1 mm. long, the anthers oblong, 1.3–1.7 mm. long; disk concave, the styles 3–5 (rarely 2), contiguous in an oblong-subconical column but free, 0.4–0.8 mm. long, rounded at apex, ventrally sulcate; fruits subglobose, costate, up to 5 mm. long and broad, surmounted by the persistent calycular rim and the eventually divaricate styles.

TYPE LOCALITY: Amboina; the basis for *Crassula scutellaria* Burm. f. is the Rumphian *pl.* 31. Merrill in his 1917 work points out that this was cited as *pl.* 30 by Burman, as it also is by Fosberg in 1948. Of the complex synonymy cited above, most combinations are based either on Burman's name or on *Aralia cochleata* Lam. (also based on the Rumphian plate) and have been elucidated by Merrill, Fosberg, and Stone. The other basic synonym is *Polyscias pinnata* J. R. & G. Forst., typified by material collected in Tanna, New Hebrides, on Cook's second voyage. This material was labelled as collected by Forster and by Anderson, although the specimens may well have come from the same plant. Since the specimen with Anderson's name bears flowers and immature fruits as well as leaves, it is herewith indicated as the lectotype and is so cited below.

DISTRIBUTION. Widespread in cultivation, but presumably indigenous in the New Hebrides and the Solomon Islands, where it occurs in forest from near sea-level to about 300 meters. The available specimens are from shrubs or trees up to 5 meters high, but in cultivation the plants

are often pruned into hedges, in which condition they flower infrequently. Such flowers as are available are indicated as pale yellow-green.

LOCAL NAMES AND USES. On Espiritu Santo, New Hebrides, the names *nēwesi* and *nüesi* have been noted, and on Efate *nanlass*, in Samoa *tagi-tagī*, and in Tonga *tanitani*. It is recorded that on Malekula, New Hebrides, the leaves of this plant are used to rub the gums with the intent of numbing the nerves prior to the extraction of teeth.

New Hebrides. ESPIRITU SANTO: Hog harbour, *I. & Z. Baker 64* (BM), 261 (BM). MALEKULA: Northwestern part, *Cheesman 27* (K, photos at BISH, US); without further locality, *Herre 69b* (NY). EFATE: Onesua, *Stone 2251* (BISH). TANNA: *Anderson* (BM lectotype, photo at US), *Forster* (K, photos at BISH, US). Samoa. UPOLU: Mulinu'u, near Apia, *McKee 3024* (BISH).

In 1965 (in *Taxon* 14: 281–285) the second author discussed the typification of *Polyscias* and the identity of its type species, *P. pinnata* J. R. & G. Forst., indicating that several widely distributed horticultural forms are closely related to and perhaps derived from *P. pinnata*. One of these, *P. scutellaria*, was discussed in detail because of the tenuous nature of characters that separate it from *P. pinnata*. It was concluded that *P. pinnata* could be maintained as distinct on the basis of having its leaves generally 3- or 5-foliolate rather than 1-foliolate, its petals and stamens 7 or 8 rather than 4 or 5, and its styles 4 or 5 (whereas the styles of *P. scutellaria* are sometimes only 3, but also often 4 or 5). A factor in a decision to maintain both concepts as species was the fact that *P. scutellaria*, based on a binomial of 1768, would have priority if the taxa were merged.

However, on reconsideration and examination of more ample material, we are unable to recognize any morphological discontinuities that are in any sense usable to divide this complex into species. Individual plants often have the leaflets either 1, 3, or 5, and the correlation of number of petals and stamens with number of styles is haphazard. The most common numbers of petals and stamens are 5, 6, and 7, and of styles 3 or 4. One specimen from Bougainville, Solomon Islands (*Kajewski 1965*, A, BISH), has the petals and stamens 5 or 6 and the styles only 2; its leaves are 1- or 3-foliolate. The Kajewski specimen came from a rain-forest tree and was apparently indigenous, and only its reduced number of styles separate it from the presumably indigenous New Hebridean specimens cited above.

We must conclude, therefore, that the forest species of the Solomons and New Hebrides, *P. pinnata*, is not separable from the widely cultivated *P. scutellaria* at any rank. It is unfortunate that the epithet of the type species of the genus is the later one.

The above description is drawn from available specimens, both from within and outside our area. It may be noted that specimens cultivated in Samoa and Hawaii are usually inclined to resemble the wild form suggested by the type of *P. pinnata*, with 3 or 5 leaflets; Micronesian and Philippine specimens usually resemble the typical and presumably cul-

tivated form of *P. scutellaria*, with unifoliolate leaves. Fosberg, however, in making the appropriate combination in 1948, pointed out that various specimens cultivated in Hawaii show all variations from pinnate to unifoliolate leaves.

In his consideration of the Micronesian species of *Polyscias* in 1965 (in *Micronesica* 2: 51–59), the second author again stressed the close relationship of *P. pinnata* and *P. scutellaria*. In the same paper he described a chimaeric variation of *P. tricochleata* that is essentially indistinguishable from *P. pinnata*, and therefore concluded that *Nothopanax tricochleatum* Miq. is merely a cultivated form of *P. pinnata*. This conclusion is herewith reinforced, but in view of our reduction of the Forsters' binomial to synonymy the correct designation of this particular form is *P. scutellaria* cv. *Tricochleata*. The cultivar is frequent in Micronesia and doubtless other tropical areas and is characterized by having leaves smaller than those of the indigenous form (of *P. pinnata*) or the normal cultivated form (of *P. scutellaria*), usually variegated and 3- or 5-foliolate, each leaflet being often further 3-divided and with coarsely crenate or spinulose-serrate margins. In our area this cultivar was reported by Yuncker (in *Bishop Mus. Bull.* 178: 92. 1943, in *op. cit.* 184: 56. 1945) as a presumable variety of *P. guilfoylei*. We note *P. scutellaria* cv. *Tricochleata* from our area as follows:

Fiji. VITI LEVU: REWA: Vicinity of Suva, *Degener & Ordonez* 13542 (A).

Samoa. TUTUILA: Pago Pago, *Bryan* 1002 (BISH). TAU: Siufaga Village, *Yuncker* 9212 (BISH).

Niue. Alofi, *Yuncker* 10051 (BISH).

11. *Polyscias guilfoylei* (Bull) L. H. Bailey in *Rhodora* 18: 153. 1916.

A shrub or small tree, glabrous throughout, usually with suberect virgate branches; leaves imparipinnate, up to 50 cm. long, the petiole slender, 10–17 cm. long on mature leaves, clasping at base and inconspicuously alate in the proximal 1–2 cm., the rachis often shallowly canaliculate, geniculate at bases of petiolules, the leaflets 5–9, the petiolules slender, of various length, the blades papyraceous, green or variegated with white margins or areolae, variously shaped and incised; inflorescences compound-paniculate to verticillate-umbellate, the primary branches 5–10, up to 60 cm. long, spreading from the very short peduncle and rachis, the secondary branches numerous, alternate or opposite or often verticillate, the primary bracts deltoid-lanceolate, acute, about 1 cm. long, soon caducous, the umbel- and flower-subtending bracts and bracteoles ovate, 0.5–2 mm. long; flowers borne in umbels on slender ultimate peduncles 5–50 mm. long (these often bracteolate and geniculate at 1 or 2 nodes), 10–25 per umbel, the pedicels slender, 3–10 mm. long, articulate at apex; flowers with a cupuliform calyx 1.2–2 mm. long and 2–2.5 mm. in diameter at apex, the rim short, undulate, denticulate with 5 or 6 inconspicuous teeth; petals 5 or 6, deltoid-oblong, 2–2.5 mm. long, unguiculate at apex; stamens as many as petals, the

filaments slender, 0.5–1 mm. long, the anthers oblong, 1–1.3 mm. long; disk concave, the styles 3–5, at first contiguous in a conspicuous column 0.8–1 mm. long, soon spreading and elongating to 1.5 mm., the stigmas shortly decurrent; mature fruits not seen.

Our description of the species and of the varieties is based on many available specimens, from both within and outside our area. The immediate relationship of *P. guilfoylei* is open to conjecture, and indeed it may have originated as a sport. Among Pacific species it is suggestive of *P. scutellaria* (including *P. pinnata*) in inflorescence characters, but the differences in foliage are striking and are summarized in our key to species.

Polyscias guilfoylei is perhaps the most widely cultivated taxon in the genus, as plants may readily be pruned into vigorous hedges. Several horticultural forms have been discussed, characterized by degree of leaf-division, variegation, etc. Three such forms are treated as botanical varieties by L. H. Bailey (Stand. Cycl. Hort. 2747–2748. 1925 and later editions). It is doubtful whether these forms merit any designation other than “cultivar,” but a definitive review of *Polyscias* in cultivation is outside the scope of this treatment. An additional cultivated form was recently discussed but not named by the second author (in *Micronesica* 2: 57. fig. 4. 1965); this has dark green, crumpled, bullate, nearly orbicular leaflets. Specimens of it have been noted from Hawaii as well as Micronesia, but not in the area of the present treatment.

For the time being we retain Bailey’s varietal concept for a form often grown in the Pacific and elsewhere, with deeply laciniate leaflets. The two forms occurring in our area may be thus distinguished:

Leaflets elliptic to oblong, spinulose-dentate at margin. var. *guilfoylei*.
 Leaflets deeply and irregularly divided or decomposed, the ultimate parts variously incised and laciniate. var. *laciniata*.

11a. *Polyscias guilfoylei* var. *guilfoylei*.

Aralia guilfoylei Bull, Cat. 1873; Cogn. & March. Pl. Ornament. 2: pl. 58. 1874.

Nothopanax guilfoylei Merr. in Philip. Jour. Sci. Bot. 7: 242. 1912; Christophersen in Bishop Mus. Bull. 128: 165. 1935; Yuncker in Bishop Mus. Bull. 220: 207. 1959; J. W. Parham, Pl. Fiji Isl. 83. 1964.

Polyscias guilfoylei L. H. Bailey in Rhodora 18: 153. 1916; Setchell in Carnegie Inst. Publ. 341: 61. 1924; Yuncker in Bishop Mus. Bull. 178: 91. 1943.

The type-including variety; leaflets with petiolules (6–) 10–20 mm. long (up to 50 mm. on terminal leaflet), the blades variable in shape but most often elliptic to oblong, (5–) 6–12 (–17) cm. long, (2.5–) 4–8 (–14) cm. broad, obtuse to acute at base, obtuse to mucronately acute at apex, conspicuously and often irregularly spinulose-dentate at margin (teeth 1–3 per centimeter), the costa sharply raised on both surfaces, the secondary nerves 5–9 per side, subascending, nearly straight, prominulous

on both sides, the veinlet-reticulation intricate, prominulous on both surfaces or plane above.

TYPE LOCALITY: Unknown, but indicated in Bull's Catalogue as "South Sea Islands." It is quite possible that Bull received his material from W. R. Guilfoyle, whose interesting account of "A botanical tour among the South Sea Islands" (in Jour. Bot. 7: 117-136. 1869) indicates that Samoa, Tonga, Fiji, the New Hebrides, and New Caledonia were visited by Guilfoyle on H.M.S. *Challenger* in 1868. It is mentioned that cultivated plants of "*Aralia*" were observed in Samoa (p. 119) and the New Hebrides (p. 133). That plants of horticultural interest were brought back is indicated by Guilfoyle's final sentence: ". . . I have been successful enough to bring with me in good condition, I have no hesitation in saying, the largest collection of choice and beautiful plants ever yet collected in the islands of the South Pacific." It is doubtful that any type specimen has been preserved.

DISTRIBUTION. Widely cultivated throughout the Pacific and American tropics, and probably in all warmer areas. Plants grow very readily from cuttings. Although comparatively few flowering specimens are available, inflorescences will probably mature if the plants are not severely pruned. When not cut back, plants develop into shrubs or small trees with ascending virgate branches, up to 6 or 7 meters in height. It is probable that the species has become naturalized in thickets near settlements in parts of its cultivated range.

LOCAL NAMES AND USES. *Tanitani* and many variant spellings have been recorded in Samoa, Niue, and Tonga, and *ndanindani* in Fiji; these names are more or less generic but apply especially to the cultivated forms. As elsewhere noted, this species is widely cultivated as a hedge plant, the abundance of the typical variety not being suggested by the few available collections.

Samoa. TUTUILA: *Setchell 297* (coll. *Sutupe*) (UC).

Niue: Near Alofi, *Yuncker 9933* (BISH).

11b. *Polyscias guilfoylei* var. *laciniata* (Hort.) L. H. Bailey in *Rhodora* 18: 153. 1916; Christophersen in Bishop Mus. Bull. 128: 165. 1935; Yuncker in Bishop Mus. Bull. 178: 92. 1943.

Panax laciniatus Hort. in Gard. Chron. 1876: 735. 1876, in *op. cit.* 1880: 759. 1880.

A variety differing from var. *guilfoylei* in its more finely divided leaves, the petiolules often to 60 mm. long, some of the blades deeply lobed or decomposed into irregular divisions, the ultimate leaflets variously incised and laciniate with numerous teeth up to 5 mm. long.

TYPE LOCALITY: Unknown; the original material brought into cultivation may have come from the Pacific area together with that of the typical form.

DISTRIBUTION. Widespread in cultivation; in our area it seems to be more abundant than var. *guilfoylei*.

LOCAL NAMES AND USES. Not distinguished from the typical form in these respects. Seemann (Fl. Vit. 115. 1865) indicates that in Fiji a juice from the bark was used as a remedy for ulcerated tongue and throat.

Fiji. Without further locality, *Seemann 204* (BM, GH, K, photos at BISH, US), *Horne 588* (K, photos at BISH, US).

Wallis Islands. UVEA: *E. Home* in 1866 (BM).

Samoa. AUNUU ISLAND (east of Tutuila): *Diefenderfer 1239* (BISH). SAMOA, without further locality: *U.S. Expl. Exped.* (GH); *Powell 36* (K, photos at BISH, US), *211* (K, photos at BISH, US).

Niue: Alofi, *Yuncker 10002* (BISH).

Tonga. TONGATAPU: *Setchell & Parks 15418* (UC).

It should be noted that Seemann cited his own and the Home specimen listed above as *Nothopanax fruticosum*; his other comments, however, appear to refer to the following species in our treatment, where his reference is listed in the synonymy.

Although in inflorescence and basic foliage characters this variety clearly belongs in *P. guilfoylei*, we have keyed it with *P. fruticosa* because its variable leaves are often decomposed. Dissected leaflets usually occur on the same plants (or even in the same leaves) as simple leaflets, and the texture and margins of the leaflets are obviously suggestive of those of typical *P. guilfoylei*.

12. *Polyscias fruticosa* (L.) Harms in E. & P. Nat. Pflanzenfam. 3(8): 45. 1894; Reehinger in Denkschr. Akad. Wiss. Wien 85: 323. 1910; Harms in Nova Guinea Bot. 8: 275. 1910, in Bot. Jahrb. 56: 412. 1921. PL. III, FIGS. 7-9.

Scutellaria tertia Rumph. Herb. Amb. 4: 78. pl. 33. 1743.

Panax fruticosum L. Sp. Pl. ed. 2. 1513. 1763; A. Gray, Bot. U.S. Expl. Exped. 1: 716. 1854; Drake, Ill. Fl. Ins. Mar. Pac. 181. 1890; Warburg in Bot. Jahrb. 13: 396. 1891; Hemsl. in Jour. Linn. Soc. Bot. 30: 180. 1894; Guillaumin in Bull. Soc. Bot. France 66: 270. 1919, in *op. cit.* 74: 698. 1927.

Nothopanax fruticosum Miq. in Bonplandia 4: 139. May, 1856, Fl. Ind. Bat. 1(1): 765. Sept. 1856; Seem. Fl. Vit. 115. 1865, in Jour. Bot. 4: 294. 1866; Merr. Interpret. Rumph. Herb. Amb. 410. 1917; Yuncker in Bishop Mus. Bull. 220: 207. 1959; J. W. Parham, Pl. Fiji Isl. 83. 1964.

Tieghemopanax fruticosus Viguier in Ann. Sci. Nat. IX. Bot. 4: 61. 1906; Guillaumin in Jour. Arnold Arb. 12: 263. 1931, in Jour. Linn. Soc. Bot. 51: 554. 1938; J. W. Parham, Pl. Fiji Isl. 86. 1964.

A shrub or perhaps a small tree, glabrous throughout; leaves irregularly pinnate-compound, usually 2 or 3 times divided but sometimes simply pinnate, up to 50 cm. long, the petiole slender, 5-14 cm. long on mature leaves, clasping at base and inconspicuously alate in the proximal 1-3 cm., the rachis subterete, obscurely geniculate at bases of petiolules, the primary leaflets usually 9-13, with slender petiolules 1-6 cm. long and usually imparipinnately once or twice divided, rarely merely pinnatifid or laciniate or deeply serrate, the ultimate leaflet-divisions papyraceous,

usually lanceolate and $3-11 \times 0.5-3$ cm. (rarely to 20×5 cm.), narrowed to an attenuate base, long-acuminate at apex, irregularly lobed or lacinate or spinulose-dentate at margin, the costa prominulous on both surfaces, the secondary nerves short, spreading, with the veinlet-reticulation essentially plane; inflorescences compound-paniculate to verticillate-umbellate, the primary branches 5-12, up to 30 cm. long, spreading or ascending from a short, stout peduncle and rachis, the secondary and tertiary branches often irregularly verticillate, the primary bracts lanceolate-oblong, 0.5-4 cm. long, soon caducous, the umbel-subtending bracts ovate, 1-2 mm. long, the flower-subtending bracteoles minute; flowers borne in umbels on slender ultimate peduncles 10-20 mm. long, 8-30 (-40) per umbel, the pedicels slender, 1-5 mm. long, articulate at apex; flowers 3-4 mm. long at anthesis, the calyx cupuliform, 1-1.7 mm. long and 1.5-2 mm. in diameter at the minutely 5-denticulate rim; petals 5, obovate-oblong, 2-3 mm. long, acute; stamens 5, the filaments slender, 1-1.2 mm. long, the anthers oblong, 1.5-2 mm. long, versatile; disk concave, the styles 2 (rarely 3), at first contiguous into a slender conical column 1-1.2 mm. long; fruits compressed and bilocular (rarely trigonous and trilocular), $4-5 \times 5-6$ mm., surmounted by the obscure calycular rim and divergent styles, these to 1.5 mm. long and with long-decurrent stigmas.

TYPE LOCALITY: Amboina; the basis for *Panax fruticosum* is the Rumphian *pl.* 33, doubtless drawn from a cultivated plant.

DISTRIBUTION. Widely cultivated throughout the Pacific and American tropics, and probably elsewhere; also popular for greenhouse cultivation. The species is commonly grown as an ornamental shrub or in hedges, attaining a height of 1-3 meters if not pruned. It flowers frequently and has white petals and styles. It may be noted that *Kajewski* 931, cited below, from the New Hebrides, is said to have been taken from a rain-forest tree 8 meters high; this could possibly be an indication of a native habitat, or it could merely represent a naturalization, since the species is freely cultivated in the New Hebrides.

LOCAL NAMES AND USES. *Tanitani* or a variant is applied in Polynesian areas; *ndanindani* in Fiji. Names noted in the New Hebrides are *nūluh* (Espiritu Santo) and *taconerecott* (Efate, ex Guillaumin). *Kajewski* notes that the leaves are boiled and eaten on Aneityum. The species is, of course, a popular ornamental.

New Hebrides. ESPIRITU SANTO: Tungwi, *I. & Z. Baker* 156 (BM). TANNA: Lenakel, *Kajewski* 63 (A, NY). ANEITYUM: Anelgauhat Bay, *Kajewski* 931 (A, BISH, NY, US).

Fiji: VITI LEVU: MBA: Tumbenasolo, valley of Namosi Creek, *Smith* 4724 (A, BISH, K, US). OVALAU: Lovoni village, *Smith* 7496 (BISH, US).

Tonga. TONGATAPU: *Graeffe* 1518 (K, photos at BISH, US).

Our description is based on many specimens from other parts of the cultivated range as well as those cited. We have not seen the Samoan specimens cited by Rechinger. It should be noted that a form with much smaller leaves, not flowering in our observation, has been collected

in Micronesia and in Hawaii, but not within our area. This form and others doubtless have horticultural designations.

The true relationship of *P. fruticosa* is not obvious. It is quite probably a horticultural variant of one of the species of *Polyscias* with two styles and ovary-locules, but its derivation from any such species in our area (species 1 to 9 in the key) seems very unlikely. Although *P. fruticosa* is not immediately related to *P. guilfoylei*, having 2 (rarely 3) rather than 3–5 styles and ovary-locules, the finely divided forms of *P. guilfoylei*, such as var. *laciniata*, may not be readily distinguished from *P. fruticosa* in sterile condition. As a rule, the leaflets of *P. guilfoylei* var. *laciniata* are even more variable and irregular than those of *P. fruticosa*, but they are usually accompanied by at least a few leaflets suggestive of the typical form (elliptic to oblong), and the marginal teeth are comparatively short.

4. *Reynoldsia* A. Gray, Bot. U.S. Expl. Exped. 1: 723. 1854, in Ann. Sci. Nat. IV. Bot. 4: 177. 1855, in Proc. Am. Acad. Arts Sci. 3: 128. 1857; Seem. in Jour. Bot. 2: 244. 1864; Harms in E. & P. Nat. Pflanzenfam. 3(8): 30. 1894; Hutchinson, Gen. Fl. Pl. 2: 58. 1967.

Reynoldsia was based on two original species, *R. sandwicensis* A. Gray, of Hawaii, and *R. pleiosperma* A. Gray, of Samoa. Both species are illustrated and the generic description would appear to have been based on both. We are not aware of an earlier designation of a lectotype species than that of Hutchinson (in 1967), who so denotes *R. sandwicensis*. *Reynoldsia* is a genus of at least 7 and perhaps 17 or more species, occurring in Samoa, the Societies, the Marquesas, and Hawaii. In the latter archipelago Sherff (Bot. Leaflet 6: 7–19. 1952) recognizes 8 species, which we do not attempt to evaluate.

In Samoa three species were recognized by Christophersen in his 1935 treatment, and we herewith add a fourth. The species are probably endemic to various islands: to Savaii 2, to Upolu 1, and to the Manua Islands 1. It must be acknowledged that none of the Samoan species are adequately known and that comparably mature parts are not available for all of them. Nevertheless, good differentiating characters are evident in the shape and margin of leaflet-blades, the inflorescence-type (as to complexity of branching and arrangement of flowers), the length of umbel-peduncles and pedicels, and the size of inflorescence-bracts.

KEY TO THE SPECIES

- Inflorescences paniculate, not umbelliferous, the ultimate branches bearing flowers (and fruits) irregularly or in whorls of 2–5 in a few clusters and apically; leaflet-blades lanceolate, subentire, inconspicuously undulate-denticulate at margin. 1. *R. pleiosperma*.
- Inflorescences umbelliferous, the flowers 5–12 in umbels, not borne singly.
 Leaflet-blades conspicuously dentate at margin with widely spaced callose-obtuse teeth; umbel-peduncles 1.5–3 cm. long, subtended by bracts 2–4 mm. long, the pedicels 7–9 mm. long. 2. *R. lanutoensis*.

Leaflet-blades inconspicuously undulate and rarely remotely and minutely callose-denticulate at margin.

Inflorescences racemose-umbellate, the umbels few, borne singly on the upper part of the inflorescence, the umbel-peduncles about 7 cm. long, simply umbelliferous at apex, the pedicels 15–20 mm. long; leaflet-blades broadly ovate, 12–14.5 × 6–8 cm. 3. *R. grayana*.

Inflorescences racemose-verticillate, the umbels laxly verticillate at 2 or 3 nodes, the umbel-peduncles, 1.5–3 cm. long, sometimes with a secondary whorl of flowers below the ultimate umbel; umbel-subtending bracts of proximal nodes conspicuous, 5–15 mm. long; leaflet-blades ovate-lanceolate, 7–12 × 3–5 cm. 4. *R. tauensis*.

1. **Reynoldsia pleiosperma** A. Gray, Bot. U.S. Expl. Exped. 1: 725. 1854, Atlas *pl.* 93, pro parte fructifera. 1857, in Ann. Sci. Nat. IV. Bot. 4: 178. 1855, in Proc. Am. Acad. Arts Sci. 3: 129. 1857; Seem. in Jour. Bot. 2: 245. 1864; Harms in Bot. Jahrb. 25: 664. 1898; Christophersen in Bishop Mus. Bull. 128: 160. 1935.

Eschweilera pleiosperma Dur. ex Drake, Ill. Fl. Ins. Mar. Pac. 183. 1890.

Trevesia pleiosperma B. & H. f. ex Jackson, Ind. Kew. 2: 1100. 1895.

A large tree, glabrous throughout; leaves imparipinnate (or perhaps sometimes even-pinnate by loss of the terminal leaflet), large, up to 90 cm. long, the petiole and rachis subterete, the petiole of mature leaves 20–40 cm. long, swollen to a clasping base and angled in the proximal 1.5–3 cm. (if alate, the wings soon lost), the leaflets 10–15, the petiolules slender, 5–20 mm. long, the blades papyraceous or subcoriaceous, lanceolate, 8–17 cm. long, 3–6 cm. broad, unequally rounded to broadly obtuse at base, gradually acuminate at apex (acumen 7–15 mm. long, slender, obtuse, marginally recurved), undulate-denticulate at margin (teeth, if present, inconspicuous, about 1 mm. long, callose-recurved), the costa raised above, prominent beneath, the secondary nerves 10–15 per side, spreading, prominulous on both surfaces, the veinlet-reticulation intricate, plane on both surfaces; inflorescences paniculate, up to 35 cm. long, not umbelliferous, the peduncle and rachis subterete, stout (3–5 mm. in diameter), the peduncle 13–17 cm. long, the secondary branches 12–17, alternate or irregularly whorled (with 4–6 borne apically), 4–13 cm. long, bearing flowers irregularly or 2–5 loosely whorled at 2 or 3 nodes and apically, the primary bracts (subtending secondary branches) oblong-lanceolate, 2–5 mm. long, caducous, the flower-subtending bracteoles about 1 mm. long, evanescent, the pedicels 5–10 mm. long (to 15 mm. in fruit); calyx cupuliform, 4–5 mm. long and in diameter, with a flaring undulate or irregularly lobed rim about 1 mm. long; petals (?8–) 10 or 11, narrowly oblong-lanceolate, at anthesis 6–7 mm. long and 1–2 mm. broad, unguiculate at apex, at length strongly reflexed and introrsely costate; stamens (?8–) 10 or 11, the filaments carnose, at length 4–5 mm. long, the anthers oblong, about 3 mm. long, versatile; stylopodium laterally flattened, about 1 mm. high, with (?16–) 20 or 22 congested radiating stigmas; fruits compressed-subglobose, sulcate, about 5 mm.

long and 6 mm. broad, surmounted by the calycular rim and the truncate-conical styler column 1–1.5 mm. high bearing linear stigmas radiating on its slightly concave apex, the pyrenes (?16–) 20–22.

TYPE LOCALITY: Savaii, Samoa; the type is the U.S. Exploring Expedition collection cited below. Christophersen (in Bishop Mus. Bull. 128: 161. 1935) has pointed out that Gray's original material came from two species, which were kept apart in the description but combined in the original plate; he has designated the fruiting specimen as the type, a choice here followed.

DISTRIBUTION. Samoa, and thus far known with certainty only from Savaii, where Christophersen indicates it to be a common tree of considerable size in forests at 700–1,700 meters altitude. It attains a height of more than 10 meters and its trunk has a diameter of 70–200 centimeters.

LOCAL NAME AND USES. *Vi vao* is the name recorded by Christophersen, who states that the fleshy fruits make it a favorite tree for pigeons and consequently well known to natives.

Samoa. SAVAII: Le To, above Salailua, *Christophersen 2935* (BISH); above Letui, *Christophersen 772* (A, BISH); Olo, above Safotu, *Christophersen & Hume 2319* (BISH, US); Mt. Maugaloa, *Vaupel 463* (BISH, US); Savaii, without further locality, *U.S. Expl. Exped.* (US 62432 type, GH fragm.). SAMOA, without other locality: *Whitmee 97* (K, photos at BISH, US).

Reynoldsia pleiosperma remained the only Samoan species of the genus recognized until 1925, when Hochreutiner described *R. lanutoensis* from Upolu, redescribed and discussed below. In 1935 Christophersen clarified the situation caused by the mixed materials in the original Exploring Expedition collection, indicating the non-type portion as a new species, *R. grayana*. We agree that this separation is warranted, and below we provide a first description for Christophersen's species and indicate points of difference between it and *R. pleiosperma*.

2. *Reynoldsia lanutoensis* Hochreutiner in *Candollea* 2: 482. 1925; Christophersen in Bishop Mus. Bull. 128: 160. 1935.

A tree, glabrous throughout; leaves imparipinnate or sometimes even-pinnate, large, up to 55 cm. long, the petiole and rachis slender, subterete, the petiole of mature leaves 16–22 cm. long, swollen to a clasping base and narrowly alate in the proximal 1–2 cm. (wings free in the distal 1–2 mm.), the leaflets 10–13, the petiolules slender, of lateral leaflets 3–13 mm. and of terminal leaflet to 23 mm. long, the blades papyraceous, ovate- or oblong-lanceolate, (4.5–) 6–12 cm. long, (2–) 2.5–5.5 cm. broad, rounded to broadly obtuse at base, acuminate at apex (acumen 5–10 mm. long, obtuse, marginally recurved), conspicuously dentate at margin (teeth widely spaced, 3–5 per side, callose-obtuse and marginally recurved), the costa plane or canaliculate above, prominent beneath, the secondary nerves 10–15 per side, spreading, with the intricate veinlet-reticulation usually plane above, prominulous beneath; inflorescences paniculate-umbellate, up to 20 cm. long, the primary axis 7–14 cm. long,

the secondary branches few, to 12 cm. long, bearing umbels whorled at several nodes (or umbels sometimes solitary), the umbel-subtending bracts lanceolate, 2–4 mm. long, entire or with a few marginal teeth, the ultimate peduncles 1.5–3 cm. long; flowers 5–10 per umbel, subtended by ovate-deltoid bracteoles about 1 mm. long, the pedicels slender, 7–9 mm. long, not articulated; calyx about 3 mm. long and 4 mm. broad, with a subtruncate or undulate rim; petals (?10–) 12, 4.5–5 mm. long; stamens (?10–) 12, the filaments short, the anthers oblong, about 2 mm. long, versatile; stylopodium laterally flattened, 1–1.5 mm. high, with 20–24 congested radiating stigmas; fruits compressed-globose, sulcate, 4–5 mm. long, 5–7 mm. broad, surmounted by the truncate-conical, bilobed, flattened styler column bearing linear stigmas, the pyrenes 20–24.

TYPE LOCALITY: Lake Lanuto, Upolu, Samoa; the type is *Hochreutiner* 3270 (deposited at Geneva), collected March 22, 1905, in forest at an altitude of about 670 meters. We have not seen this collection, but the original description leaves no doubt of its identity.

DISTRIBUTION. Samoa, and thus far known only from Upolu, where it occurs in forest or open grassland at altitudes of 650–750 meters. It has been noted as a tree 6–10 meters high, with green fruit.

LOCAL NAME. *Vi vao* has been recorded by Christophersen.

Samoa. UPOLU: Near Malololelei, *Christophersen* 951 (A, BISH, US); above Malololelei, ridge to Mt. Vaitou, *Christophersen* 262 (BISH, US); summit of Mt. Fao, *Christophersen* 551 (BISH).

From the other three species now known from Samoa, *R. lanutoensis* differs in having its leaflet-blades conspicuously dentate with widely spaced teeth. Although the actual teeth are small, callose-obtuse, and marginally recurved (and not very different from those of *R. pleiosperma* and the other Samoan species), they surmount undulations some 2–5 mm. deep, the blades thus appearing more coarsely dentate than in the related species. While the flowers of *R. lanutoensis* are clearly umbellate, a second whorl of flowers is sometimes borne on the peduncle just below the apical umbel, suggesting that the mode of flower-bearing in this species and in *R. pleiosperma* is not basically very diverse. Nevertheless the two species are readily separable, at least on the basis of the collections currently available.

3. *Reynoldsia grayana* Christophersen in Bishop Mus. Bull. 128: 161. 1935.

Reynoldsia pleiosperma A. Gray, Bot. U.S. Expl. Exped. 1: 725, p.p. 1854, Atlas pl. 93, pro parte alabastro et foliacea. 1857.

A tree, glabrous throughout: leaves imparipinnate, large, probably more than 40 cm. long, the petiole and rachis subterete, the leaflets at least 7, the petiolules slender, of lateral leaflets 8–15 and of terminal leaflet to 20 mm. long, the blades broadly ovate, (6–) 12–14.5 cm. long, (3–) 6–8 cm. broad, rounded or truncate-obtuse at base, acute to gradually

acuminate at apex, undulate or obscurely denticulate at margin (teeth, if present, 2 or 3 per margin, callose-obtuse, scarcely 1 mm. long), the costa raised above, prominent beneath, the secondary nerves 8–15 per side, spreading, prominulous on both surfaces, the veinlet-reticulation intricate, immersed or impressed on both surfaces; inflorescences racemose-umbellate, up to 22 cm. long, the peduncle at least 10 cm. long, the secondary branches few (about 5), about 7 cm. long, simply umbelliferous at apex; flowers 5 or 6 per umbel, the pedicels comparatively stout (1–2 mm. in diameter), 15–20 mm. long, gradually swollen distally, not articulated; calyx obconical, 3–4 mm. long and in diameter, with an erect undulate rim; petals 8–10, narrowly oblong-lanceolate, about 1.5 mm. broad, 4–5 mm. long and calyptrate in bud but doubtless free at anthesis, unguiculate at apex; stamens 8–10, the filaments carnose, about 2 mm. long in bud, the anthers oblong, 2–2.5 mm. long in bud, versatile; stylopodium truncate-conical, laterally flattened, about 2 mm. in diameter at the slightly concave apex, the stigmas about 18, linear, radiating.

TYPE LOCALITY: Savaii, Samoa; the type is the U.S. Exploring Expedition collection cited below.

DISTRIBUTION. Samoa, known only from the type material. It is indicated by Pickering (Geogr. Distr. Animals and Plants 2: 294. 1876) that the Exploring Expedition Samoan material included only one collection referable to *Reynoldsia*. For that reason one may assume that both parts of the mixture treated by Gray and illustrated in the Atlas were indeed "brought by the forest-king from Interior Savaii," to use Pickering's words.

Samoa. Savaii, without further locality: *U.S. Expl. Exped.* (us 73913 type, GH fragm.).

As discussed under *R. pleiosperma*, we follow Christophersen in his choice of the fruiting material available to Gray as the type of that species, the balance serving as the type of *P. grayana*. The latter species has not previously been described, but Christophersen referred to a portion of Gray's earlier comments and to part of an illustration, thus seeming to have met the letter of the International Code. The Exploring Expedition specimen deposited as *R. pleiosperma* in the U.S. National Herbarium includes poorly preserved material which quite clearly came from two different plants. We have now separated this material as two herbarium sheets, one of which may serve as the holotype of Gray's species and the other as the holotype of Christophersen's.

Reynoldsia grayana differs from *R. pleiosperma* in having its inflorescences clearly umbelliferous, the umbels being long-pedunculate and the pedicels much longer. The leaflet-blades of *R. grayana* are broadly ovate and about twice as long as broad, those of *R. pleiosperma* being lanceolate and about three times as long as broad. From *R. lanutoensis*, the present species differs very obviously in the shape and margins of its leaf-blades, in its simpler inflorescences, long umbel-peduncles, and long pedicels. On the basis of material now available, *R. grayana* seems to

have fewer petals and stamens than either *R. pleiosperma* or *R. lanutoensis*, but we consider this variation of minor significance.

4. *Reynoldsia tauensis* A. C. Smith & B. C. Stone, sp. nov.

Reynoldsia sp. Christophersen in Bishop Mus. Bull. 128: 161. 1935; Yuncker in Bishop Mus. Bull. 184: 55. 1945.

Arbor ubique glabra; foliis ad 60 cm. longis videtur paripinnatis, petiolo et rhachidi subteretibus, petiolo 22–25 cm. longo ad basim amplexentem incrassato et 1–2 cm. anguste alato, rhachidi petiolulorum basi contracta, foliolis 10–12, petiolulis gracilibus 5–15 mm. longis, laminis papyraceis ovato-lanceolatis, 7–12 cm. longis, 3–5 cm. latis, basi subaequaliter rotundatis, apice in acuminem obtusum margine recurvatum breviter cuspidatis, margine anguste recurvatis cartilagineis inconspicue undulatis et dentibus callosis haud 1 mm. longis raro et remote denticulatis, costa supra paullo elevata subtus prominente, nervis secundariis utrinsecus 10–15 supra planis subtus prominulis, rete venularum intricato supra immerso subtus conspicuo plano; inflorescentiis apices ramulorum versus infra folia congestis, juvenilibus ad 15 cm. longis racemoso-verticillatis, pedunculo gracili ad 9 cm. longo, umbellulis 5–8 in nodis 2 vel 3 laxe verticillatis, bracteis umbelliferis papyraceis anguste lanceolatis 5–15 mm. longis (superioribus interdum 2–3 mm. longis) margine minute serrulatis, umbellularum pedunculis gracilibus 1.5–3 cm. longis interdum verticillum secundarium gerentibus; floribus 8–12 per umbellulam pedicellatis, pedicellis in alabastro 2–3 mm. longis non articulatis, bracteolis floriferis oblongo-deltaideis 1–2 mm. longis acutis; calyce turbinato circiter 2.5 mm. longo et lato, limbo erecto ad 1 mm. longo undulato et irregulariter 3–5-denticulato; petalis 8–10 in alabastro oblongo-deltaideis valvatis apice unguiculatis; staminibus 8–10; stylopodio in alabastro vadose concavo, stigmatibus 16–18 sessilibus radiatis.

TYPE LOCALITY: Tau, Manua Islands, Samoa; the type is *Garber 752*.

DISTRIBUTION. Known only from the type collection and probably endemic to the Manua Islands; at least Paul L. Guest indicated to Yuncker (*loc. cit.* 1945) that the species is abundant on all the (Manua) islands. The only documented collection was taken from a tree about 3 meters high at an altitude of 685 meters.

LOCAL NAME. No name was indicated on the original label, but Yuncker (*loc. cit.* 1945) has listed *vi vao*, which apparently is applied to the genus in Samoa.

Samoa. TAU, Manua Islands: Top of peak back of Tau, January 28, 1922, *Garber 752* (BISH type).

Both Christophersen and Yuncker implied that the cited Tau specimen represents an undescribed species; even though it lacks mature flowers and fruits we venture to describe it. In having the inflorescence compound and the flowers umbellate it clearly resembles *R. lanutoensis*, differing in its essentially entire rather than conspicuously dentate leaflet-

blades and in its comparatively large umbel-subtending bracts. From *R. grayana* the new species differs in its more complex inflorescence, its short umbel-peduncles, its presumably shorter pedicels, and its ovate-lanceolate, proportionately narrower leaflet-blades.

5. *Plerandra* A. Gray, Bot. U.S. Expl. Exped. 1: 729. 1854, in Ann. Sci. Nat. IV. Bot. 4: 178. 1855, in Proc. Am. Acad. Arts Sci. 3: 129. 1857; Seem. in Jour. Bot. 2: 241. 1864, Fl. Vit. 117. 1865; Harms in E. & P. Nat. Pflanzenfam. 3(8): 28. 1894; A. C. Sm. in Bishop Mus. Bull. 141: 116. 1936, in Jour. Arnold Arb. 36: 286. 1955; Hutchinson, Gen. Fl. Pl. 2: 61. 1967.

Bakeria Seem. in Jour. Bot. 2: 248. 1864, Fl. Vit. 117. 1865, *op. cit.* 429. 1873.
Nesopanax Seem. in Jour. Bot. 2: 249. 1864, Fl. Vit. 116. 1865.

Plerandra, typified by the Fijian *P. pickeringii*, is believed to include about 14 species occurring in New Guinea, the Solomons, and Fiji; it has not yet been discovered in the New Hebrides. Seven endemic species terminate its range in Fiji.

The Fijian species of *Plerandra* have been puzzling, but the reasonably adequate herbarium material now available indicates that they are well differentiated. They are probably all polygamo-dioecious, or perhaps sometimes polygamo-monoecious, and consequently there have been misinterpretations of floral dimensions and of the shape of the stylopodium, since these differ in staminate and perfect flowers. There is remarkable variation in the number of stamens from 15 in *P. bakeriana* to as many as 500 in *P. pickeringii*, and in the number of styles, stigmas, and ovary-locules from 5 to 17. While such numbers do not always permit rigid specific delimitation, they are usable within limits. Seemann's genus *Bakeria*, based on the species now known as *P. bakeriana*, does not consistently have 15 stamens and 5 ovary-locules as originally supposed by him; the stamens are actually 15–20 and the ovary-locules and stigmas are 5–8, indicating that even this distinct species cannot be separated from *Plerandra*. As a matter of fact, in 1873 Seemann himself emended *Bakeria* to note that its stamens could be as many as 23, but we have not observed more than 20. Seemann's genus *Nesopanax*, based on the species currently known as *P. vitiensis*, was said to differ from *Plerandra* in having its petals free rather than calyptrate, and by having 5–7 ovary-locules and free styles. In fact, however, in *P. vitiensis* the ovary-locules vary from 5 to 11; all the *Plerandrae* have eventually separating petals, whether or not they are connate in bud; and the styles of *P. vitiensis* become proximally connate in the stylopodium of the fruit.

The most distinct species is perhaps *P. insolita*, with short-pedicellate flowers congested on the distal portion of short rays and scarcely umbellate. Also very distinct is *P. pickeringii*, with the largest number of stamens (200–500) and with a very conspicuously elongated stylopodium of firmly connate styles. *Plerandra bakeriana* is readily distinguished by its reduced number of stamens, but otherwise it is not strikingly different

from several other of our species. *Plerandra grayi* is likely to be confused with *P. vitiensis* but is actually reasonably distinct on the basis of its numerous stamens (as many as 250), its large flowers, and its broad leaflets with obviously rounded apices. The remaining three species form a related group, but characters referring to stamen-number, fruit shape, stylopodium, and number and size of leaflets are useful in recognizing them.

KEY TO THE SPECIES

- Inflorescences composed of umbels, the flowers borne at the apices of elongate rays rarely less than 5 cm. long and usually much longer.
- Stylopodium inconspicuous, in fruit 1–2.5 mm. long, the styles sometimes completely or partially separate, sometimes connate with marginally projecting stigmas.
- Styles and ovary-locules 5–11; stamens not more than 150; flowers comparatively small, the petals 4–7 mm. long; leaflet-blades rarely more than 10 cm. broad.
- Stamens usually 1-seriate, 15–20; styles and ovary-locules usually 5 or 6 (rarely 7 or 8); flowers small, the petals about 4 mm. long; fruits 10–12 × 8–10 mm., the stigmas projecting marginally from the truncate-concave apex of the stylopodium; leaflets 5–8 (–10). 1. *P. bakeriana*.
- Stamens at least 2-seriate, 25 or more; flowers with the petals 5–7 mm. long.
- Leaflets 3–6 (–7); fruits oblong-ellipsoid, about 20 × 10 mm., the stigmas obviously separate on the truncate-concave apex of the inconspicuous stylopodium; ovary-locules 5–8; stamens 50–75. 2. *P. grandiflora*.
- Leaflets 5–10 (rarely 4–12); fruits ellipsoid, not much longer than broad, 8–14 × 7–11 mm.
- Stamens 2-seriate, 25–35; ovary-locules 5–8; stylopodium in fruit composed of connate styles and minutely concave at apex; leaflets usually 5–7, the blades 8–15 × 3.5–7 cm. 3. *P. victoriae*.
- Stamens 3–5-seriate, 75–155; ovary-locules usually 7–10 (sometimes 5–11); stylopodium in fruit composed of styles connate proximally but free at the spreading or erecto-patent apices; leaflets usually 7–10, the blades usually 13–23 × 4–9 cm. 4. *P. vitiensis*.
- Styles and ovary-locules usually 12–15 (rarely 11); stamens 3–5-seriate, 120–250; flowers comparatively large, the petals 8–12 mm. long; fruits 11–20 × 10–15 mm., the stylopodium composed of short, stout styles connate into a centrally concave ring; leaflet-blades usually 14–30 × 6–14.5 cm., broadly rounded at apex. 5. *P. grayi*.
- Stylopodium obvious, in fruit 5–10 mm. long, conical-cylindric, composed of 9–17 firmly connate styles with stigmas marginal on the truncate apex; stamens numerous, 200–500; flowers large, the petals 9–16 mm. long; fruits large, 20–40 × 17–25 mm. 6. *P. pickeringii*.
- Inflorescences lacking true umbels, the flowers congested distally on short rays (4–8 cm. long) in a strobilus-like pseudo-umbel 1–5 cm. long; stamens 50–75; flowers comparatively large, the petals 7–8 mm. long; fruits large, 25–

36 × 18–30 mm., with a persistent calycular rim and a short (1–2 mm. long) stylopodium, the 9–12 styles firmly connate. 7. *P. insolita*.

1. *Plerandra bakeriana* A. C. Sm. in Bishop Mus. Bull. 141: 118. 1936; J. W. Parham, Pl. Fiji Isl. 84. fig. 34. 1964.

PL. VII, FIGS. 3, 4.

Bakeria vitiensis Seem. in Jour. Bot. 2: 249. fig. (p. 248). 1864, Fl. Vit. 117. pl. 21. 1865; Anon. in Gartenfl. 36: 71. 1887, in Kew Bull. 1888: 95. 1888.

Plerandra vitiensis B. & H. f. ex Drake, Ill. Fl. Ins. Mar. Pac. 183. 1890; Harms in E. & P. Nat. Pflanzenfam. 3(8): 29. 1894; non Baill. (1880).

A small tree, glabrous throughout; leaves clustered near ends of branchlets, digitately compound, the petioles subterete, up to 25 cm. long, expanded at base into a coriaceous sheath 10–15 mm. broad, the ligule broadly ovate, as much as 7 mm. long, thinner at margin, the leaflets 5–8 (–10), the petiolules 1–4 (–6) cm. long, the blades subcoriaceous, elliptic-ovate, usually 8–17 cm. long and 4–7 cm. broad, acute to attenuate at base, subacute to broadly obtuse at apex, the costa prominent beneath, the secondary nerves usually 7–12 per side, inconspicuously raised on both surfaces, the veinlet-reticulation immersed; inflorescences umbellate, composed of 8–15 umbels radiating from a stout peduncle 1–2.5 cm. long, the rays 4.5–23 cm. long, the subtending bracts soon caducous, the flowers often 15–40 (but sometimes as few as 10) per umbel, on pedicels 1.5–3 cm. long; staminate flowers with a short calyx 2.5–3 mm. long, flaring and sinuate at margin; calyx slightly larger in perfect flowers; petals 5, thick, deltoid-ovate, acute, unguiculate, about 4 mm. long; stamens usually 1-seriate and often 15, sometimes as many as 20, about 2 mm. long, the anthers oblong, obtuse, about 1.5 mm. long; disk concave; stigmas minute, like the locules usually 5 or 6, sometimes 7, rarely 8; fruits ellipsoid to subglobose, inconspicuously costate when dried, usually 10–12 × 8–10 mm., the stylopodium 1–2 mm. long, the stigmas projecting as obtuse, inconspicuous, marginal protuberances on the truncate-concave apex, the pyrenes lunulate.

TYPE LOCALITY: Namosi Province, Viti Levu, Fiji; the type is *Seemann 209*, cited below.

DISTRIBUTION. Known only from the island of Viti Levu, Fiji, and there infrequently collected. Insofar as data are available, the species occurs in ridge and crest thickets at 900–1,100 meters, but the Seemann and MacGillivray & Milne specimens may come from lower elevations. Field notes are inadequate, but the plant is recorded as a small tree about 5 meters high, the fruit being black at maturity.

LOCAL NAME. *Sole* has been noted by Parham, but this is essentially a generic name in Fiji.

Fiji. VITI LEVU: MBA: Mt. Evans Range, *Greenwood 382* (K, photos at BISH, US). NAMOSI: Mt. Naitarandamu, *Gillespie 3153* (BISH, GH, NY, UC); Korombasambasanga Range, *Fiji Dept. Agr. 2197* (A, SUVA); Mt. Voma, *Gillespie 2712* (BISH), *Fiji Dept. Agr. 1723* (A, BISH, SUVA); probably near Namosi Village, *See-*

mann 209 (K type, photos at BISH, US; GH isotype); Viti Levu without locality, *MacGillivray & Milne 99* (K, photos at BISH, US).

This species, with a comparatively small number of stamens and carpels, is readily distinguished from other Fijian *Plerandrae* on that basis, but its floral parts are not as consistent in number as believed by Seemann. It is the sole species of the genus *Bakeria* Seem., which subsequent authors have merged with *Plerandra*.

2. *Plerandra grandiflora* A. C. Sm. in Bishop Mus. Bull. 141: 117. fig. 61. 1936; J. W. Parham, Pl. Fiji Isl. 85. 1964.

Shrub or slender tree, glabrous throughout, the leaves and inflorescences aggregated toward ends of branchlets, the branchlets terete, sparsely lenticellate; leaves digitately compound, the petioles subterete, 6–20 cm. long, expanded at base into a sheath 15–20 mm. broad, the ligule coriaceous, subentire, 5–9 mm. long, the leaflets 3–6, rarely 7, the petiolules subterete, 1–5 cm. long, the blades subcoriaceous, elliptic, 7–18 cm. long, 3.5–8 cm. broad, attenuate at base, obtuse or rounded at apex, narrowly revolute at margins, the costa prominent on both surfaces, the secondary nerves 7–16 per side, slightly raised on both surfaces or subimmersed, the veinlet-reticulation immersed; inflorescences umbellate, with several or numerous umbels radiating from a very short peduncle, the rays usually 11–17 cm. long, the subtending bracts caducous, the flowers (11–) 20–25 per umbel, on stout pedicels 1–2 cm. long; calyx smooth, coriaceous, cylindrical-ellipsoid, at anthesis 6–8 mm. long and about 5 mm. in diameter, truncate at margin; petals 5, carnose, deltoid-ovate, 5–6 mm. long, 3–4 mm. broad, thickened and slightly unguiculate at apex; stamens 2- or 3-seriate, 50–75, the filaments filiform, usually about 4 mm. long, the anthers oblong, about 1.5 mm. long, obtuse; styles 5–8, separate, short and obscure, forming a small ring of papillae on the flattened or rounded summit of the gynoe-cium, the locules 5–8, with thick walls; fruits oblong-ellipsoid, carnose when fresh and smooth or inconspicuously ridged when dry, about 2 × 1 cm. at apparent maturity, the stylopodium projecting about 1 mm., the stigmas obviously separate on the truncate-concave apex, the pyrenes lunulate, about 15 × 4 mm., with straight inner margins.

TYPE LOCALITY: Mt. Kasi, Yanawai River region, Thakaundrove Province, Vanua Levu, Fiji; the type is *Smith 1777*, cited below.

DISTRIBUTION. Known only from two collections made on the island of Vanua Levu, Fiji, where it occurs at elevations of 300–1,030 meters in dense crest thickets. Field notes indicate the plant as a shrub or slender tree about 3 meters high; the petals and stamens are pale yellow and the fruit black. The available specimens were collected in May and November, each bearing flowers and the type fruits as well.

LOCAL NAME. *Ndanindani* was recorded for no. 1777, although this name otherwise seems to refer to the genus *Polyscias* in Fiji.

Fiji. VANUA LEVU: THAKAUNDOVE: Mt. Kasi, Yanawai River region, *Smith*

1777 (BISH type, GH, K, NY, UC, US); summit of Mt. Mbatini, *Smith 680* (BISH, GH, K, NY, UC, US).

In stamen number *P. grandiflora* is intermediate between *P. bakeriana* and *P. victoriae* on the one hand and *P. vitiensis* on the other. On the basis of the type collection the reduced number of leaflets (to three) is noteworthy. The second collection cited above was in 1936 (in Bishop Mus. Bull. 141: 117) referred to *P. victoriae* by the first author, but on reconsideration we prefer to place it in *P. grandiflora*. The number of leaflets seems of secondary importance in comparison with such characters as the comparatively elongate fruit and the intermediate number of stamens.

3. *Plerandra victoriae* Gibbs in Jour. Linn. Soc. Bot. 39: 150. 1909; A. C. Sm. in Bishop Mus. Bull. 141: 117, *quoad typum*. 1936; J. W. Parham, Pl. Fiji Isl. 86. 1964. PL. VII, FIG. 5.

Plerandra sp. A. C. Sm. in Bishop Mus. Bull. 141: 118. 1936.

A glabrous shrub or small tree; leaves digitately compound, the petioles up to 23 cm. long, expanded at base into a coriaceous sheath 2–3 cm. broad, the ligule deltoid-lanceolate, as much as 2 cm. long, acute, thinner at margin, the leaflets usually 5–7 (rarely 4 or 8), the petiolules (1–) 2–4 cm. long, the blades subcoriaceous, elliptic, usually 8–15 cm. long and 3.5–7 cm. broad, obtuse to attenuate at base, rounded or broadly obtuse at apex, narrowly revolute at margin, the costa prominent on both surfaces, the secondary nerves usually 10–14 per side, prominulous on both surfaces, the veinlet-reticulation immersed; inflorescences umbellate, composed of 5–12 umbels borne near the apex of a variable peduncle 2–12 cm. long, the rays 4–9 cm. long, the subtending bracts soon caducous, the flowers usually 12–16 per umbel, on pedicels 5–12 mm. long; calyx about 6 mm. long in perfect flowers but shorter in staminate flowers, sinuate-truncate at margin; petals 5, deltoid-ovate, usually 6–7 × 3–4 mm., unguiculate; stamens usually biseriate and 25–35, the filaments slender, about 2.5 mm. long, the anthers 2–3 mm. long, obtuse; stigmas small, on subconnate short styles, like the locules 5–7, rarely 8; fruits ellipsoid, smooth or inconspicuously costate, 8–12 × 7–9 mm., the stylopodium 1–2.5 mm. long, truncate-conical, composed of the short connate styles and minutely concave at apex.

TYPE LOCALITY: Mt. Tomanivi (Mt. Victoria), Mba Province, Viti Levu, Fiji; the type is *Gibbs 784*, cited below.

DISTRIBUTION. Endemic to Fiji and known only from the two largest islands at elevations of 1,000–1,323 meters (on Viti Levu) and 700 meters (on Vanua Levu). The species occurs infrequently in the dense mossy forest and thickets of ridges and summits, as a compact or slender tree or shrub 2–3 meters high; the petals are blackish without and white within, the stamens are yellow, and the fruits are deep purple, doubtless becoming black at maturity.

LOCAL NAME. *Sole*, as for other Fijian *Plerandrae*.

Fiji. VITI LEVU: MBA: Summit ridge of Mt. Tomanivi, *Gibbs 784* (BM type, photo at US), *Gillespie 4112* (BISH), *Smith 5145* (A, BISH, US). VANUA LEVU: THAKAUNDOVE: Mt. Ndikeya, eastern buttress, *Smith 1890* (BISH, NY, US).

In 1936 the first author took his no. 680, from Vanua Levu, to represent *P. victoriae*, but in our reconsideration we believe this specimen better placed in *P. grandiflora*, as noted above. *Smith 1890*, in 1936 suggested as a possibly undescribed relative of *P. bakeriana*, is now seen to have no basic characters separating it from *P. victoriae*, otherwise not recorded from Vanua Levu.

The closest relative of *P. victoriae* is probably *P. vitiensis*, but its stamens are notably fewer, its ovary-locules are usually (but not invariably) fewer, its styles are firmly connate in the stylopodium of the fruit rather than distally free, and its usually fewer leaflet-blades are quite consistently smaller. Both of these species differ from *P. grandiflora* most obviously in fruit shape, but also in stamen number and in (usually) more numerous leaflets. The three species form a series in various characters but seem readily distinguishable.

4. *Plerandra vitiensis* (Seem.) Baill. Hist. Pl. 7: 169. fig. 221. 1879;
A. C. Sm. in Bishop Mus. Bull. 141: 116. 1936; J. W. Parham, Pl.
Fiji Isl. 86. 1964. PL. VII, FIGS. 1, 2.

Nesopanax vitiensis Seem. in Jour. Bot. 2: 249. fig. 1864, Fl. Vit. 117, pl. 20.
1865; Anon. in Gartenfl. 36: 71. 1887, in Kew Bull. 1888: 110. 1888.

Plerandra seemanni B. & H. f. ex Drake, Ill. Fl. Ins. Mar. Pac. 183. 1890.

Plerandra nesopanax Harms in E. & P. Nat. Pflanzenfam. 3(8): 29. 1894.

A tree usually 5–20 m. high, glabrous throughout; leaves digitately compound, the petiole often stout, up to 60 cm. long, expanded at base into a coriaceous sheath often 3 cm. broad, the ligule broadly ovate-deltoid, to 1 cm. long, the leaflets 6–12 (usually 7–10), the petiolules usually 2–5 (sometimes 1–7) cm. long, the blades thin-coriaceous, oblong-obovate to oblanceolate or elliptic, as much as 27 × 10.5 cm. but usually 13–23 cm. long and 4–9 cm. broad, acute to attenuate at base, rounded to obtuse at apex, narrowly recurved at margin, the costa raised above, prominent beneath, the secondary nerves usually 10–17 per side and prominulous on both surfaces, the veinlet-reticulation immersed; inflorescences umbellate, composed of 9–35 umbels radiating from a stout peduncle usually 2–3 cm. long, the rays diverse in length, 6–26 cm. long, the subtending bracts deltoid-lanceolate, to 1.5 cm. long, caducous, the flowers (3–) 10–40 per umbel, on pedicels usually 2–4 cm. long; calyx conical, 5–6 mm. long (staminate somewhat smaller), truncate-sinuate at margin; petals 5, deltoid, 5–6 mm. long; stamens usually 3–5-seriate and 100–120 (sometimes 75–155), the filaments slender, 2–2.5 mm. long, the anthers narrowly oblong, obtuse, 1.5–2 mm. long; disk flat or slightly convex; styles usually 7–10 (sometimes 6 or 11, possibly rarely 5), short, separate, with terminal stigmas, the locules rarely as many as 12; fruits ellipsoid, inconspicuously costate when dried, at maturity 8–14 × 9–11 mm., the stylopodium 1–2.5 mm.

long, the styles connate proximally, with spreading or erecto-patent apices and often pale terminal stigmas.

TYPE LOCALITY: Southern Ovalau, Fiji; the type is *Seemann 207*, cited below. Seemann indicated his specimen as from "Port Kinnaird," a name used at the time of his 1860 visit for the waters between Ovalau and Moturiki sheltered by the Yanutha Islands. In his book *Viti* (pp. 67–68, 1862), Seemann discusses the possibility of Port Kinnaird being developed into the capital of Fiji, an unrealized hope of a few settlers.

DISTRIBUTION. Endemic to Fiji, and thus far known from the islands of Viti Levu, Ovalau, and Vanua Levu, occurring with some frequency in dense or open forest at elevations of 100–1,150 meters. It is reported as a tree 5–20 meters high, often slender; the petals at anthesis are rich purple without and pale green within, the anthers are pale yellow, the stylopodium and styles are white, and the fruits are dark purple to black at maturity.

LOCAL NAMES. *Sole* is generally referred to this species, for which the first author has also recorded on Vanua Levu the names *kaikai* and *ndani-ndani*; both of these are doubtful, and the last generally denotes the genus *Polyscias*.

Fiji. VITI LEVU: MBA: Slopes of Mt. Nairoso, Mt. Evans Range, *Smith 4060* (A, BISH, K, NY, US); vicinity of Nandarivatu, *Parks 20749* (BISH, UC, US), *Degener 14380* (A, BISH, K, NY, UC, US); Mt. Nanggaranambuluta, near Nandarivatu, *Smith 4756* (A, BISH, K, NY, US), *Greenwood 870* (A); east of Nandala Creek, south of Nandarivatu, *Smith 5943* (A, BISH, K, NY, US); Mt. Tomanivi, *Smith 5124* (A, BISH, K, NY, US). NANDRONGA & NAVOSA: Northern portion of Rairaimatuku Plateau, between Nandrau and Rewasau, *Smith 5422* (A, BISH, K, NY, US); between Nandrau and Nanga, *Smith 5492* (A, BISH, K, NY, US). SERUA: North of Komave, *St. John 18965* (BISH, US). NAMOSI: Mt. Vakarongasiu *Gillespie 3270* (US). OVALAU: West of Lovoni Valley, on ridge south of Mt. Korolevu, *Smith 7515* (BISH, US); east of Lovoni Valley, *Smith 7275* (BISH, US); vicinity of Levuka, *Gillespie 4533* (BISH, GH, UC); southern Ovalau, *Seemann 207* (GH, K type, photos at BISH, US). VANUA LEVU: MBUA: Southern slope of Mt. Seatura, *Smith 1621* (BISH, GH, K, NY, UC, US). MATHUATA: Southern base of Mathuata Range, north of Natua, *Smith 6773* (A, BISH, K, US). THAKAUNDROVE: Mt. Mariko, *Smith 412* (BISH, GH, K, NY, UC, US). FIJI, without other locality: *Tothill 224* (K, photos at BISH, US).

This fairly variable species is distinguished from the first three species in this treatment most readily by the greater number of stamens, which are usually 100–120. Its fruit is also characteristic, the styles being obviously free in the apical part of the stylopodium. In comparison with our first three species *P. vitiensis* usually has more numerous and larger leaflets, although foliage characters in *Plerandra* are by no means dependable. The following species, *P. grayi*, will superficially often be mistaken for *P. vitiensis*.

5. *Plerandra grayi* Seem. Viti 437, *nomen*. 1862, in Jour. Bot. 2: 242. fig. (p. 241). 1864, Fl. Vit. 117, pl. 22. 1865; Drake, Ill. Fl. Ins. Mar.

Pac. 183. 1890; A. C. Sm. in Bishop Mus. Bull. 141: 116. 1936; J. W. Parham, Pl. Fiji Isl. 85. *fig.* 35. 1964. PL. VII, FIGS. 6-9.

Plerandra sp. A. Gray in Proc. Am. Acad. Arts Sci. 5: 318. 1862, in Bonplandia 10: 36. 1862.

Plerandra graeffei Anon. in Gartenfl. 36: 71. 1887, in Kew Bull. 1888: 117. 1888.

A small tree, glabrous throughout; leaves digitately compound, the petiole subterete, stout, up to 60 cm. long, expanded at base into a coriaceous sheath 2-3 cm. broad, the ligule broadly ovate, 1-2 cm. long, the leaflets 4-10 (usually 6-9), the petiolules 2.5-7 cm. long, the blades subcoriaceous, usually broadly obovate, less frequently oblanceolate or lanceolate, (11-) 14-30 cm. long, (5-) 6-14.5 cm. broad, acute and decurrent at base, usually broadly rounded at apex, recurved or nearly plane at margin, the costa flattened above, prominent beneath, the secondary nerves usually 9-16 per side, prominulous on both sides or plane above, the veinlet-reticulation immersed; inflorescences umbellate, composed of 7-30 umbels radiating from a variable peduncle up to 10 cm. long, the rays (5-) 12-30 cm. long, the subtending bracts oblong-deltoid, subcoriaceous, 1-2 cm. long, caducous, the flowers 15-40 per umbel, on pedicels 1.5-3 cm. long; calyx of perfect flowers broadly cupuliform, 6-8 mm. long and 5-7 mm. broad, truncate-sinuate at margin; petals 5, carnose, deltoid, 8-12 mm. long, 5-7 mm. broad, unguiculate; stamens usually 3-5-seriate, (120-) 175-250, the filaments slender, diverse but usually 2-3 mm. long, the anthers oblong, obtuse, 2-2.5 mm. long; disk slightly concave at center, flat marginally; stigmas minute, essentially sessile, like the locules 11-15; fruits ellipsoid or nearly subglobose, usually obviously costate, at apparent maturity 11-20 × 10-15 mm., subtruncate at apex, the stylopodium scarcely exceeding the broad scar of staminal attachment, the short, stout styles connate into a centrally concave ring and terminated by minutely grooved stigmas, the pyrenes lunulate.

TYPE LOCALITY: Viti Levu, Fiji; the type is *Seemann 208*, cited below. Although Seemann indicated no detailed locality, the holotype bears the note "July 1860." In the early part of that month Seemann was in southern Viti Levu between the Navua River and the present town of Ngaloa (*Viti*, pp. 95-117. 1862); during the rest of July he seems to have been in Ovalau, Mbau, and Tailevu not primarily engaged in botanical work. Therefore we may assume his no. 208 to have been collected along the Serua coast.

DISTRIBUTION. Endemic to Fiji and thus far known only from Viti Levu, where it occurs apparently infrequently at elevations up to 400 meters in forested areas. It is indicated as a usually slender tree 5-10 meters high; the petals are greenish with copious rich purple markings without, or at least obviously purple-tinged, and greenish white within; the stamens are cream white to greenish white; and the fruits are black at maturity.

LOCAL NAME. The generic name *sole* is commonly used for *P. grayi*.

Fiji. VITI LEVU: SERUA: Vatutavathe, vicinity of Ngaloa, *Degener 15201* (A, BISH, K, NY, UC, US). NAMOSI: Hills bordering Wainavindrau Creek, vicinity of Wainimakutu, *Smith 8523* (BISH, US), *8568* (US); east of Wainikoroiluva River, near Namuamua, *Smith 8902* (BISH, US), *9046* (BISH, US). NAITASIRI: Tamavua, *Gillespie 2464* (BISH, UC); Prince's Road, *Meebold 16558* (K, photos at BISH, US), *Fiji Dept. Agr. 196* (SUVA). TAILEVU: East of Wainimbuka River, vicinity of Ndakuivuna, *Smith 7140* (BISH, US). REWA: Mt. Korombamba, *Parks 20118* (BISH, UC); "vicinity of Suva," *Meebold 16555* (BISH). VITI LEVU without other locality (probably Serua Province): *Seemann 208* (K type, photos at BISH, US; isotypes at BM, GH, erroneously labelled *209*, photo at US).

Although *P. grayi* and *P. vitiensis* are superficially similar, the broader and more obviously rounded leaflet-blades of the former are characteristic, but this is not completely dependable. The petals and fruits of *P. grayi* are larger than those of *P. vitiensis*, and the stamens are also more numerous. The ovary-locules of *P. grayi* are 11–15, those of *P. vitiensis* being 5–11. The very short stylopodium of the fruit of *P. grayi* bears very short styles connate into a centrally concave ring, whereas the stylopodium of the fruit of *P. vitiensis* is comparatively obvious, the styles being definitely free distally.

6. *Plerandra pickeringii* A. Gray, Bot. U.S. Expl. Exped. 1: 729. 1854, Atlas *pl. 95*. 1857, in Ann. Sci. Nat. IV. Bot. 4: 178. 1855, in Proc. Am. Acad. Arts Sci. 3: 129. 1857; Seem. in Jour. Bot. 2: 242. 1864, Fl. Vit. 117. 1865; Drake, Ill. Fl. Ins. Mar. Pac. 183. 1890; A. C. Sm. in Bishop Mus. Bull. 141: 116. 1936, in Jour. Arnold Arb. 33: 103. 1952; J. W. Parham, Pl. Fiji Isl. 86. 1964.

PL. VIII, FIGS. 1, 2.

A tree to 15 m. high or shrub, glabrous throughout; leaves digitately compound, the petiole stout (to 1.5 cm. in diameter), subterete, up to 100 cm. long, sometimes verrucose-lenticellate, expanded at base into a coriaceous sheath 2–4 cm. broad, the ligule oblong-deltoid, 1–2 cm. long, the leaflets 6–12 (usually 7–11, rarely as many as 16), the petiolules stout, (1.5–) 3–13 cm. long, the blades subcoriaceous, obovate or oblong-obovate or oblanceolate, usually 16–40 cm. long and 6–22 cm. broad, occasionally up to 47 × 24 cm., acute to attenuate at base, rounded to obtuse or broadly acute at apex, usually plane at margin, the costa often prominent on both surfaces, the secondary nerves usually 10–20 per side, raised on both surfaces or plane above, the veinlet-reticulation prominulous to immersed; inflorescences umbellate, composed of 7–15 umbels radiating from a stout, short peduncle usually 2–3 cm. long, the rays 10–50 cm. long, subtended by lanceolate-deltoid bracts 1.5–2 cm. long, these soon caducous, the flowers 20–60 per umbel, on pedicels 3–5.5 cm. long; flowers borne terminally or closely aggregated on the clavate ultimate 3 cm. of the ray, subtended by coriaceous oblong bracts 1–1.5 cm. long, these soon caducous; perfect flowers with an obconical-cupuliform calyx 8–12 mm. long and 7–10 mm. broad at the sinuate-undulate margin, the calyx of staminate flowers usually 5–7 mm. long and broad; petals usually 5, rarely 4–6,

appearing calyptrate in bud but eventually free, carnose, oblong-deltoid, 9–16 mm. long, 6–10 mm. broad, subacute, inconspicuously unguiculate; stamens usually 5–7-seriate, numerous, usually 400–500 in staminate flowers and 200–350 in pistillate flowers, the filaments slender, very variable (2–10 mm.) in length, the anthers narrowly oblong, obtuse, similarly variable (2–5 mm.) in length; disk flattened or slightly convex, the stylopodium at anthesis bluntly conical, about 1 mm. long, composed of firmly connate styles and minute terminal stigmas; styles usually 11–16 (rarely 9–17), the locules similar in number; fruits ellipsoid or subglobose, at maturity strongly costate, 20–25 (–40) mm. long (excl. stylopodium), 17–20 (–25) mm. broad, the stylopodium conspicuous, broadly conical at base, cylindric above, 5–10 mm. long, ridged, with extrorse stigmas marginal on the truncate apex, the pyrenes lunulate.

TYPE LOCALITY: Ovalau, Fiji; the type is a U.S. Exploring Expedition specimen, cited below.

DISTRIBUTION. Endemic to Fiji and doubtless to be expected on most of the high islands from near sea-level to 1,050 meters. It occurs in many types of forest as a slender tree 3–15 meters high (rarely noted as a shrub), with the leaves and the large terminal inflorescences clustered at apices of branchlets. The calyx and petals are white to green or yellowish, usually purple-tinged; the filaments and anthers are white to pale yellow; the stylopodium in flower is yellowish white with pale green stigmas; and the fruits are black at maturity.

LOCAL NAMES AND USES. This species is most commonly known as *sole* or *sole ndina* (i.e., the true *sole*). In interior Viti Levu the name *sole ngua* has been reported, and also the use of trunks as posts for fish weirs. The local name *vola* has been reported from Vanua Levu, and also *ndanindani*, both of these being of questionable application to *Plerandra*.

Fiji. VITI LEVU: MBA: Mt. Nairoso, Mt. Evans Range, *Smith 4021* (A, BISH, K, NY, US); vicinity of Nandarivatu, *Gillespie 3707* (BISH); between Nggaliwana and Nandala Creeks, south of Nauwanga, *Smith 5803* (A, BISH, US). SERUA: Between Navua River and Wainiyavu Creek, near Namuamua, *Smith 8978* (BISH, US). RA: Mataimeravula, near Vaileka, *Degener 15440* (A, BISH, K, NY, UC, US). NAITASIRI: Matawailevu, Wainamo Creek, *St. John 18223* (BISH, US); Tamavua, *Gillespie 2156* (BISH, GH, NY); Nasinu, *Gillespie 3432* (BISH, GH); Kalambo, *Tothill 222* (A, BISH, K), *Fiji Dept. Agr. 11242* (SUVA). REWA: Namboro, *Fiji Dept. Agr. 5916 p. p.* (BISH, SUVA). KANDAVU: Mt. Mbuke Levu, *Smith 205* (BISH, GH, K, NY, UC, US); without locality, *Fiji Dept. Agr. 11943* (SUVA). OVALAU: *U.S. Expl. Exped.* (US 62359 type; fragmentary isotype at GH). KORO: Eastern slope of main ridge, *Smith 936* (BISH, GH, K, NY, UC, US). NGAU: East of Herald Bay, inland from Sawaieke, *Smith 7751* (BISH, US). VANUA LEVU: MBUA: Southern portion of Seatovo Range, *Smith 1524* (BISH, GH, K, NY, UC, US). MATHUATA: Seangangga Plateau, vicinity of Natua, *Smith 6896* (A, BISH, K, NY, US). THAKAUNDOVE: Maravu, near Salt Lake, *Degener & Ordonez 14274* (A, BISH, K, NY, UC, US). TAVEUNI: Western slope near Waiyevo and Wairiki, *Gillespie 4678* (BISH, NY, UC). MOALA: Near Naroi, *Smith 1309* (BISH, GH, K, NY, UC, US).

The type species of *Plerandra*, *P. pickeringii*, is remarkably robust in

its foliage and inflorescence dimensions, but its distinctness among our species rests on its characteristic fruits, which have the stylopodium conspicuous (5–10 mm. long) and composed of completely connate styles. The fruit is also comparatively large; when smaller than about 20×17 mm. one may suspect it to be immature. Nevertheless certain specimens, such as *Smith 6896* (the subject of our PLATE VIII, FIG. 1), have comparatively small and globose fruits that are not entirely characteristic. The functionally staminate flowers have the extraordinary number of 400–500 stamens, while the perfect flowers seem to have 200–350 stamens, remarkably high for the genus.

7. *Plerandra insolita* A. C. Sm. in Jour. Arnold Arb. 33: 103. 1952;
J. W. Parham, Pl. Fiji Isl. 86. 1964. PL. VIII, FIGS. 3–7.

A slender tree to 9 m. high, glabrous throughout; leaves digitately compound, the petiole stout, subterete, 40–70 cm. long, often verrucose-lenticellate, expanded at base into a coriaceous sheath 2–4 cm. broad, the ligule oblong, 1.5–3 cm. long, the leaflets 5–12 (usually 8–11), the petiolules stout, 2–7 (–10) cm. long, the blades subcoriaceous, oblong- or obovate-elliptic or oblanceolate, 20–41 cm. long, 5–22 cm. broad, acute to attenuate at base, obtuse to rounded at apex, narrowly recurved at margin, the costa prominent on both surfaces, the secondary nerves 12–25 on each side, raised on both surfaces, the veinlet-reticulation prominulous beneath or immersed; inflorescences compound-pseudo-umbellate, arising from branchlets below leaves, composed of 5–7 rays borne at or near the apex of a short, stout peduncle 1–5 cm. long, the rays 4–8 cm. long, conspicuously swollen in the distal 1–5 cm. and copiously cicatricose, the flowers 15–35 or perhaps more per ray, congested in a strobilus-like pseudo-umbel, the pedicels very short at anthesis, elongating to 6–18 mm. in fruit, subtended by subcoriaceous oblong bracts about 1.5 cm. long, these persistent through anthesis; calyx of perfect flowers obconical-cupuliform, 7–9 mm. long and 5–7 mm. broad, irregularly lobed on the margin of the short spreading limb; calyx of staminate (and usually distal) flowers 3–5 mm. long; petals 5 or 6, rarely 4, carnose, subconnate into a conical calyptra, deltoid, $7-8 \times 4-6$ mm., inconspicuously unguiculate; stamens 2- or 3-seriate, 50–75, the filaments slender, 1–3.5 mm. long, the anthers oblong, obtuse, 2–3 mm. long; disk flattened, the stylopodium short-conical or umbonate, sulcate, composed of firmly connate styles with minute stigmas; styles and locules 9–12; fruits ellipsoid or subglobose, carnose and smooth when fresh, when dried coriaceous and strongly costate, 25–36 mm. long, 18–30 mm. broad, the calycular rim apically persistent, the stylopodium stout, 1–2 mm. long and 3–5 mm. in diameter, with grooved stigmas conspicuously projecting marginally on the truncate apex, the pyrenes falcate-obovoid.

TYPE LOCALITY: Southern slopes of Mt. Ndelainathovu, on the escarpment west of Nandarivatu, Mba, Viti Levu, Fiji; the type is *Smith 4922*, cited below.

DISTRIBUTION. Endemic to Fiji and thus far known only from Viti Levu, where it occurs infrequently at elevations from near sea-level to 1,160 meters. It has been found in dense or open forest as a slender tree, unbranched or sparingly branched, with a sticky colorless latex. The petals are purple without and pale green or white within; the filaments are white or greenish and the anthers yellow; the disk is pale green at anthesis; and the fruits are black at maturity.

LOCAL NAMES. While *sole* is the general name for this species, it has also been recorded as *sole lailai* and *sole ngua* in interior Viti Levu.

Fiji. VITI LEVU: MBA: Mt. Ndelainathovu, west of Nandarivatu, *Smith 4922* (A type, BISH, K, US); vicinity of Nandarivatu, *Parks 20753* (BISH, UC), *Gillespie 4319* (BISH, UC). SERUA: Mbuyombuyo, near Namboutini, *Tabualewa 15584* (A, BISH, K, NY, UC, US); Vatuvilakia, vicinity of Ngaloa, *Degener 15172* (A, BISH, K, NY, UC, US); north of Ngaloa, in drainage of Waininggere Creek, *Smith 9166* (BISH, US); Nakavu, Navua River, *Parks 20384* (BISH, UC, US). NAMOSI: East of Wainikoroiluva River, near Namuamua, *Smith 8912* (BISH, US); hills near Navua River, *Greenwood 1048* (A, BISH, NY). NAITASIRI: Wainisavulevu-Numbulolo divide, *St. John 18325* (BISH, US); Viria, *Meebold 16557* (BISH); Central Road, *MacDaniels 1149* (BISH); Suva Ditch trail, *Bryan 376* (BISH); near Nanduna Village, *Fiji Dept. Agr. 12593* (BISH, SUVA); Tamavua, *Gillespie 2465* (BISH, GH, US). REWA: Namboro, *Fiji Dept. Agr. 5916 p. p.* (SUVA). VITI LEVU without further data: *Seemann 206* (BM, GH, K, photos at BISH, US) (July 1860; probably from the Serua coast; cf. comment on type locality of *P. grayi*, above).

A redescription of this striking species seems desirable in view of the number of available collections not at hand in 1952; these collections permit a few emendations but only serve to strengthen the status of the species. *Plerandra insolita* suggests *P. pickeringii* in the robustness of its foliage parts, but it is the most distinct of our species because of its contracted inflorescence, of which the flowers are not borne in umbels but rather in congested spirals on the clavate or cylindrical distal portion of each ray. A further differentiating character is the comparatively large and persistent calycular rim. The fruits are as large as those of *P. pickeringii* but very different in characters of the stylopodium; and of course the stamens are not comparable in number to those of *P. pickeringii*. While a rigid concept of *Plerandra* might incline students of the family to segregate *P. insolita* generically, we feel that the circumscription of the genus is not greatly disturbed by the inclusion of this remarkably distinct species. In Hutchinson's 1967 system *P. insolita* would fall into the tribe Cussonieae, far removed from *Plerandra*, and the concept would probably require a new genus.

6. *Schefflera* J. R. & G. Forst. Char. Gen. Pl. 45, *nomen conservandum*. 1776; Seem. in Jour. Bot. 3: 175. 1865, Fl. Vit. 116. 1865; Harms in E. & P. Nat. Pflanzenfam. 3(8): 35. 1894, in Bot. Jahrb. 56: 385. 1920; Hutchinson, Gen. Fl. Pl. 2: 69. 1967.

Schefflera, typified by the New Zealand *S. digitata* J. R. & G. Forst.,

is a widespread tropical and subtropical genus, but its limits are still open to interpretation. In his 1894 review of the family, Harms used *Schefflera* in a broad sense, including *Heptapleurum* Gaertn. and *Agalma* Miq. On the other hand, Hutchinson in 1967 reinstated *Agalma* (at least in the sense of Miquel's type species and some 22 others) and also combined *Cephaloschefflera* Merr. (*Schefflera* sect. *Cephaloschefflera* Harms) with a greatly expanded *Brassaia* Endl.

As the family is under further consideration by specialists, we cannot suggest reasonable limits for *Schefflera* on the basis of our restricted review. It is evident that our first five species, with paniculate-racemose inflorescences and free styles, belong in *Schefflera* in even the limited sense. The remaining four species, with compound-umbellate inflorescences, would fall into Harms' concept of his subsection *Agalma* (but this concept may not be strictly identical with Miquel's genus in a narrow sense). Of our species, *S. actinostigma* has free styles, whereas both this and *S. tannae* show transitional stages between paniculate-racemose and compound-umbellate inflorescences. It would seem that even among our few species inflorescence-characters of a satisfactory generic nature are evasive.

For present purposes we adopt *Schefflera* in the more inclusive sense, retaining in it species with strictly compound-umbellate inflorescences as well as with connate styles, but we refrain from suggesting its synonymy.

KEY TO THE SPECIES

- Inflorescences paniculate-racemose, with numerous lateral branches bearing flowering umbels racemosely arranged; fruits comparatively small, usually less than 6×6 mm. at maturity, with 5–10 locules; leaflet-blades with 7–18 secondary nerves per side.
- Indument (on young parts, some foliage parts, and inflorescence-axes) composed of conspicuous, coarse, scale-like, many-celled hairs 2–10 mm. long; primary inflorescence-bracts conspicuous, 25–40 mm. long, the umbel-subtending bracts 5–10 mm. long. 1. *S. euthytricha*.
- Indument lacking or composed of minute, inconspicuous hairs (in nos. 2 and 3 the hairs sometimes scale-like and 0.5–3.5 mm. long, but sparse and usually evanescent); primary inflorescence-bracts comparatively small, 3–15 mm. long, the umbel-subtending bracts 1–6 mm. long.
- Leaflet-blades of normal adult leaves copiously denticulate-serrate at margin (teeth spinulose, 1–7 per centimeter); styles and ovary-locules often more than 5.
- Styles and ovary-locules (6–) 7–10, the styles in fruit conspicuous, 1–1.2 mm. long; flowers comparatively small, with petals 1.3–1.5 mm. long; leaflets with petiolules 5–15 mm. long and blade-margins finely denticulate, the teeth irregular, 2–7 per centimeter. 2. *S. samoensis*.
- Styles and ovary-locules 5 or 6, the styles in fruit 0.5–0.7 mm. long; flowers with petals about 2 mm. long; leaflets with conspicuous petiolules 20–40 mm. long and blade-margins coarsely denticulate, the teeth 1–3 per centimeter. 3. *S. neo-ebudica*.

Leaflet-blades of normal adult leaves entire or crenulate at margin (teeth not spinulose or evanescently so, rarely as many as 2 per centimeter); flowers apparently consistently 5-merous, with 5 styles and ovary-locules.

Inflorescences comparatively compact, the lateral branches 3-5 cm. long; leaflets 9-13, the blades rounded to broadly obtuse at apex. 4. *S. tannae*.

Inflorescences comparatively ample, the lateral branches usually 15-40 cm. long; leaflets (5-) 7-9, the blades acute to acuminate at apex. 5. *S. vitiensis*.

Inflorescences compound-umbellate, with comparatively few branches, 1-3 times divided, the flowering umbels aggregated at apices of rays; fruits comparatively large, usually more than 6 × 6 mm. (sometimes to 13 × 11 mm.) at maturity, with 5-12 locules; leaflet-blades with 20-30 secondary nerves per side, these often interspersed with others nearly as obvious.

Fruits truncate at apex, surmounted by the subsistent calycular rim, the stylopodium flattened, the styles 5-7, divergent, 1-1.5 mm. long; inflorescences racemose-umbellate (tertiary branches whorled at a median node and also aggregated at ray-apex); leaves with the petiole 36-50 cm. long, the petiolules 3-5 cm. long, the blades 11-22 × 6-9 cm., rounded or broadly retuse at apex. 6. *S. actinostigma*.

Fruits with an obvious stylopodium projecting beyond the inconspicuous calycular rim or scar, the styles connate into an obvious column 1.5-2 mm. long; inflorescences strictly compound-umbellate; leaves with the petiole less than 22 cm. long, the petiolules 1-3.5 cm. long.

Leaves with a conspicuous petiolar ligule free in the distal 3-4 cm., the leaflet-blades conspicuously acuminate at apex; fruits with 8-12 costae and locules, the styler column stout, conical, about 1.5 mm. long and 1-1.5 mm. in apical diameter. 7. *S. costata*.

Leaves (not known for no. 9) with a petiolar ligule free for less than 1 cm., the leaflet-blades rounded or obtusely short-acuminate at apex; fruits with 5-9 costae and locules, the styler column slender, about 2 mm. long.

Infructescences comparatively compact, the peduncles of rays 2-9 cm. long; fruits 11-13 × 9-11 mm., 5-7-costate, the stylopodium conical, projecting (at base of styler column) about 2 mm. above the calycular rim. 8. *S. seemanniana*.

Infructescences ample, the peduncles of rays 4-12 cm. long; fruits 7-9 × 8-10 mm., 6-9-costate, the stylopodium rounded, projecting (at base of styler column) 2-3 mm. above the calycular rim. . . 9. *S. sp.*

1. *Schefflera euthytricha* A. C. Sm. in Contr. U.S. Natl. Herb. 37: 86. 1967. PL. VI.

As no additional specimens have been located since the recent original description, it is not necessary to supplement that, other than by the illustration.

TYPE LOCALITY: Namosi Province, Viti Levu, Fiji; the type is *Smith 8908*, cited below.

DISTRIBUTION. Endemic to Fiji, and thus far known from only two localities in the vicinity of the junction of the Wainikoroiluva and Navua

Rivers, south-central Viti Levu, where it occurs in dense forest at an elevation of 50–200 meters. The available specimens are from slender trees 5–6 meters high, with a conspicuous, dull brown inflorescence-tomentum; the calyx, petals, and filaments are greenish white, and the anthers white. Both known specimens, in flowering condition, were obtained in October 1953.

LOCAL NAME. The type collection was indicated as *sole tangane*.

Fiji. VITI LEVU: SERUA: Hills between Navua River and Wainiyavu Creek, near Namuamua, *Smith 8983* (BISH, US). NAMOSI: Hills east of Wainikoroiluva River, near Namuamua, *Smith 8908* (BISH, US 2192113 type).

As indicated in connection with the original description, *S. euthytricha* agrees with its only close ally in Fiji, *S. vitiensis*, in basic inflorescence-characters, differing obviously in its striking indument and large inflorescence-bracts. In respect to its indument, *S. euthytricha* is approached by *S. samoensis* and *S. neo-ebudica*, endemic to Samoa and the New Hebrides respectively, but the three species are sharply distinct in the several characters utilized in our key.

2. ***Schefflera samoensis*** (A. Gray) Harms in E. & P. Nat. Pflanzenfam. 3(8): 39. 1894; Reinecke in Bot. Jahrb. 25: 663. 1898; Rechinger in Denkschr. Akad. Wiss. Wien 85: 325. 1910; Christophersen in Bishop Mus. Bull. 128: 164. 1935. PL. IV, FIGS. 3–5.

Paratropia samoensis A. Gray, Bot. U.S. Expl. Exped. 1: 722. 1854.

Cheirodendron samoense Seem. in Jour. Bot. 5: 237. 1867.

Heptapleurum samoense B. & H. f. ex Drake, Ill. Fl. Ins. Mar. Pac. 183. 1890.

A small tree or shrub, the young branches, petioles, petiolules, and sometimes leaflet-costae beneath densely or sparsely hirsute with pale linear-lanceolate many-celled hair-like scales 1–3.5 mm. long, soon glabrate; leaves digitately compound, the petiole slender, 10–25 cm. long, expanded to an inconspicuously clasping sheath, the ligule free in the distal 3–5 mm., obscurely bifid at apex, the leaflets (5–) 6–9, the petiolules slender, 5–15 mm. long, the blades papyraceous, oblanceolate to narrowly obovate, (4–) 8–20 cm. long, (1.5–) 2.5–7.5 cm. broad, gradually attenuate at base, usually conspicuously acuminate at apex, strongly denticulate-serrulate at margins (teeth spinulose, irregular, 2–7 per centimeter), the costa elevated on both surfaces, the secondary nerves 7–13 per side, arcuate-ascending, with the veinlet-reticulation usually plane above and prominulous beneath; inflorescences paniculate-racemose, the axes irregularly pilose but sometimes sparsely hirsute like vegetative parts, soon glabrate, the main rachis stout, up to 30 cm. long, the primary branches subopposite or irregularly disposed, 13–25, up to 25 cm. long, the umbels borne on slender peduncles (1–) 5–18 mm. long at anthesis and up to 30 mm. long in fruit, the flowers usually 3–10 per umbel, the pedicels 1–5 mm. long (to 7 mm. in fruit), the primary inflorescence-bracts oblong-deltoid, 3–6 mm. long, the umbel-subtending bracts 1–3 mm. long; flowers 1.5–2 mm. long at anthesis, the calyx broadly cupuliform, 0.5–1 mm. long, with

a slightly flaring rim of 4–6 minute deltoid lobes; petals 4–6, oblong-deltoid, 1.3–1.5 mm. long, 0.7–1.2 mm. broad, unguiculate-thickened at apex; stamens 4–6, the filaments slender, 1–1.5 mm. long, the anthers oblong, rounded, versatile, 0.5–0.6 mm. long; ovary-apex rounded, the stigmas more numerous than petals, (6–) 7–10 (like ovary-locules), the styles minute, about 0.2 mm. long at anthesis, appressed in a small umbonate projection; fruits broadly subglobose, 2–3 mm. long and 3–3.5 mm. broad, conspicuously (6–) 7–10-costate, broadly conical at apex, the styles 1–1.2 mm. long, radiating or reflexed, clavate at apex and with oblique stigmas.

TYPE LOCALITY: Upolu, Samoa; the type is the U.S. Exploring Expedition specimen cited below.

DISTRIBUTION. Endemic to Samoa, and definitely known only from the islands of Savaii and Upolu, where it occurs with some frequency in forests and ridge thickets at elevations of 700–1,500 meters (according to Christophersen's notes). It is indicated as a tree or shrub 3–5 meters high, with green or yellowish petals, and with dark brown or perhaps black fruits.

LOCAL NAME. The only name we find recorded is *maialeale* (*Christophersen 234*).

Samoa. SAVAII: Above Matavanu Crater, *Christophersen 634* (BISH); inner slopes of Matavanu Crater, *Christophersen & Hume 2225* (A, BISH, US); near Olo, above Safotu, *Christophersen & Hume 2270* (A, BISH, US); "Mataana," *Vaupel 351* (BISH, NY, US). UPOLU: Above Malololelei, *Christophersen 234* (BISH, NY); without definite locality: *U.S. Expl. Exped.* (US 47926 type). SAMOA, without definite locality: *Whitmee 56* (K, photos at BISH, US), *s. n.* (BM, GH). We have not seen the following numbers cited by Rechinger: *Rechinger 1610* and *1753* from Savaii, *1847* and *1919* from Upolu.

Schefflera samoensis is sharply characterized by its finely denticulate leaflet-margins and by its small flowers and fruits. Whereas the other species of this relationship have the ovary-locules and styles similar in number to the other flower-parts, *S. samoensis* has usually 7–10 locules and styles, although the petals and stamens are 4–6 in number. The conspicuous and radiating styles in fruit further distinguish this very distinct Samoan endemic.

3. *Schefflera neo-ebudica* Guillaumin in Bull. Mus. Hist. Nat. II. 9: 289. 1937, in Jour. Linn. Soc. Bot. 51: 554. 1938. PL. IV, FIG. 6.

Schefflera sp. Guillaumin in Jour. Arnold Arb. 12: 263. 1931.

A small tree, glabrous throughout or with a few coarse many-celled hair-like scales 0.5–1 mm. long at base of petioles and on leaf-sheaths (and rarely with a few obscure, minute, stellate hairs on inflorescence-branches); leaves digitately compound, the petiole stout, 15–27 cm. long, expanded at base into a coriaceous clasping sheath, the ligule rounded, free in the distal 1 cm., the leaflets 7–10, the petiolules 2–4 cm. long, the blades papy-

raceous, narrowly elliptic to oblanceolate, 12–25 cm. long, 4–7 cm. broad, attenuate at base, caudate-acuminate (but easily broken) at apex with an obtuse tip 1.5–2 cm. long, coarsely dentate at margin (teeth spinulose, 1–3 per centimeter), the costa slightly raised above and prominent beneath, the secondary nerves usually 8–12 per side, erecto-patent, with the veinlet-reticulation plane above and prominulous beneath; inflorescences paniculate-racemose, up to 40 cm. in length, pedunculate, the main rachis up to 28 cm. long, the primary branches 10 or more in number, usually 12–17 cm. long, the umbels borne on slender peduncles 4–8 mm. long, the flowers usually 5–7 per umbel, the pedicels 2–5 mm. long, the primary inflorescence-bracts oblong-deltoid, 4–6 mm. long, the umbel-subtending bracts 2–3 mm. long; flowers with a small cupuliform calyx with 5 or 6 minute deltoid lobes; petals 5 (or 6?), deltoid, about 2 mm. long; stamens 5 (or 6?), the filaments about as long as the anthers; styles (and ovary-locules) 5 or 6, the styles minute in flower; fruits broadly subglobose, 3–3.5 mm. long, 3.5–4 mm. broad, and strongly 5- or 6-costate when dried (up to 6 × 5 mm. when fresh, ex Kajewski), the stylopodium extending about 1 mm. above the calycular scar and sharply angled, the styles 0.5–0.7 mm. long, free and spreading or recurved from a shortly connate basal portion, the stigmas minute.

TYPE LOCALITY: New Hebrides; Guillaumin does not indicate a type but cites three specimens: *de la Rüe* from Ambrym, *de la Rüe* from Pentecost, and *Kajewski 114* from Lenakel, Tanna. We have seen duplicates of the latter two, and the last is an excellent fruiting specimen with duplicates in several herbaria. Therefore, we herewith designate *Kajewski 114* (holotype at Paris) as the lectotype. This was one of the two Kajewski specimens cited without an epithet by Guillaumin in 1931.

DISTRIBUTION. Endemic to the New Hebrides, and thus far known from the islands of Espiritu Santo, Pentecost, Ambrym, Tanna, and Aneityum, at elevations of 200–1,000 meters in forested areas. It is recorded as a tree 5–7 meters high; the only color notes (on *Kajewski 845*) indicate the fruit as cream-colored.

LOCAL NAMES. The name *narku* is recorded from Espiritu Santo, and *kassaskelimbueret* from Pentecost.

New Hebrides. **ESPIRITU SANTO:** Between Ladhogh and Turworsoksok, *I. & Z. Baker 138* (BM). **PENTECOST:** Between Kumre and Lasup, *de la Rüe* (A). **AMBRYM:** Mt. Toüo, *de la Rüe* (not seen in this study). **TANNA:** Lenakel, March 6, 1928, *Kajewski 114* (isotypes at A, K, NY, photos at BISH, US). **ANEITYUM:** Anelgauhat Bay, *Kajewski 845* (A, BISH, K, NY, photos at BISH, US).

In 1931 Guillaumin cited *Kajewski 114* and *845* as presumably representing two separate species, but they seem without doubt to be conspecific. Among the species of our area, *S. neo-ebudica* suggests only *S. samoensis*, clearly differing in its leaves with conspicuous petiolules and more coarsely denticulate blade-margins, the larger flowers, and the normal number (5 or 6) of ovary-locules and styles, the latter being comparatively short, although also free, in fruit.

4. *Schefflera tannae* A. C. Smith & B. C. Stone, sp. nov. PL. V.

Schefflera sp. Guillaumin in Jour. Arnold Arb. 12: 263. 1931.

Arbor ad 15 m. alta ubique mox glabra, partibus novellis forsan parce puberulis; foliis digitatis, petiolis subteretibus 15–30 cm. longis, basi in vaginam coriaceam parce lenticellatam incrassatis, ligula late rotundata 4–6 mm. longa; foliolis 9–13, petiolulis gracilibus 1–3 cm. longis, superne anguste alatis, laminis papyraceis oblanceolatis vel obovatis, 8–22 cm. longis, 3.5–8 cm. latis (lateralibus saepe minoribus), basi attenuatis et in petiolulum longe decurrentibus, apice rotundatis vel late obtusis, margine anguste revolutis et subintegris vel obscure crenatis (dentibus haud 1 per centimetrum), costa supra elevata subtus prominente, nervis secundariis utrinsecus 8–12 adscendentibus subtus prominulis, rete venularum plano vel utrinque prominulo; inflorescentiis (immaturis solis visis) paniculato-racemosis ad 22 cm. longis, rhachide crassa et pedunculo ad 4 cm. longis, ramulis secundariis erecto-patentibus circiter 5 bracteis papyraceis ad 15 mm. longis mox caducis subtentis, ramulis tertiariis brevibus (3–5 cm. longis) oppositis vel aggregatis, bracteis mox caducis; umbellularum pedunculis gracilibus 3–6 mm. longis, floribus 6–12 per umbellulam, pedicellis in alabastro circiter 1 mm. longis bracteolis deltoideo-rotundatis haud 0.5 mm. longis subtentis; calyce cupuliformi haud 0.5 mm. longo, lobis 5 deltoideis minutis; petalis 5 oblongo-deltoideis in alabastro circiter 1 mm. longis apice cucullatis; disco subplano, staminibus 5, stylis in alabastro minutis erectis contiguis; fructibus non visis.

TYPE LOCALITY: Lenakel, Tanna, New Hebrides; the type is *Kajewski 131*.

DISTRIBUTION. Known only from the type collection and presumably endemic to the New Hebrides. The species is indicated by the collector to be common in rain-forest at an elevation of 200 meters; the available material is from a tree about 15 meters high, with a trunk 50 centimeters in diameter.

New Hebrides. TANNA: Lenakel, March 7, 1928, *Kajewski 131* (A type, BISH, K, NY).

Although the single collection here described does not bear fully mature inflorescences, we venture to describe it because the foliage- and inflorescence-characters are strikingly distinct from those of *S. neo-ebudica*, which is known from the same locality. From the earlier species our novelty differs sharply in its essentially entire leaflet-blades with rounded or obtuse apices. It is also characterized by more compact inflorescences with fewer and shorter lateral branches, which appear to be aggregated at two or three nodes along the rachis, suggesting a transition toward a compound-umbellate condition that is further emphasized in *S. actinostigma*, discussed below.

5. *Schefflera vitiensis* (A. Gray) Seem. in Jour. Bot. 3: 176. 1865, Fl. Vit. 116. 1865; Drake, Ill. Fl. Ins. Mar. Pac. 182. 1890; Harms in

E. & P. Nat. Pflanzenfam. 3(8): 39. 1894; Gibbs in Jour. Linn. Soc. Bot. 39: 148. 1909; J. W. Parham, Pl. Fiji Isl. 86. 1964.

PL. IV, FIGS. 1, 2.

Aralia vitiensis A. Gray, Bot. U.S. Expl. Exped. 1: 715. 1854, Atlas *pl.* 89. 1857.

A tree, glabrous throughout at maturity, or with a close, scaly, minute indument subpersistent on lower surfaces of leaflets, inflorescence-axes, etc.; leaves digitately compound, the petiole 12–42 cm. long, expanded to a coriaceous sheathing base, the ligule ovate-oblong, subacute and sometimes bifid at apex, free in the distal 1–3 cm., the leaflets (5–) 7–9, the petiolules (0.5–) 2–10 cm. long, the blades papyraceous, oblanceolate or narrowly obovate or elliptic, (5–) 10–34 cm. long, (2.5–) 4–12 cm. broad, attenuate to acute at base, acute to acuminate at apex, usually entire or crenulate at margin on mature leaves but sometimes sparsely denticulate (teeth 1 or 2 per centimeter, evanescently spinulose), the costa slightly raised above, prominent beneath, the secondary nerves 8–18 per side, erecto-patent, often prominulous above and sharply raised beneath, the veinlet-reticulation immersed or prominulous beneath; inflorescences lateral on branchlets below terminal clusters of leaves, paniculate-racemose, glabrous to scurfy-pilose on axes, up to 100 cm. in length, short-pedunculate, the main rachis often stout and subflexuose, the primary branches usually 15–25 in number, alternate or subopposite, usually 15–40 cm. long, the primary bracts papyraceous to subcoriaceous, oblong, subacute, 3–8 mm. long (or longer on peduncular portion); umbels borne on slender peduncles 4–7 mm. long at anthesis and up to 15 mm. long in fruit, the flowers usually 5–10 per umbel, the pedicels 2–4 mm. long, subtended by minute bracteoles, the umbel-subtending bracteoles up to 5 mm. long; flowers 2–3.5 mm. long at anthesis, the calyx cupuliform, 1–2 mm. long, with 5 minute deltoid lobes; petals 5, oblong-deltoid, 1.2–1.7 mm. long, unguiculate at the acute apex; stamens 5, the filaments slender, at length about 1 mm. long, the anthers oblong, obtuse, 0.5–0.8 mm. long; ovary-apex flattened or rounded, the stigmas 5, sessile in flower, papilliform, soon elongating; fruits depressed-subglobose, at maturity 4–6 mm. long and broad, conspicuously 5-costate when dried, broadly conical at apex, the styles free except at base, sharply reflexed, 0.4–0.6 mm. long.

TYPE LOCALITY: Ovalau Fiji; the type is the U.S. Exploring Expedition specimen cited below.

DISTRIBUTION. Endemic to Fiji and probably occurring on most of the high islands, being common at elevations of about 50–1,130 meters in various types of forest, crest-thickets, etc. It is usually noted as a slender, freely branched, or gnarled tree 3–18 meters high, with a trunk up to 20 centimeters in diameter, and with characteristically congested leaves at the apices of branchlets and profuse inflorescences lateral just below the leaves. The inflorescence-axes and calyces are purple or purple-tinged; the petals and filaments are pale green to pale yellow, with nearly white

anthers; the disk is green in flower; and the mature fruit is dull purple to black.

LOCAL NAMES AND USES. Frequently recorded names on Viti Levu are *sole*, *sole lewa*, *sole ngga*, and *sangole*. On Vanua Levu the names *ndani-dani*, *kaikai*, and *kai-i-voli* have been noted, and on Ovalau *ndai-ndainga*. In Serua Province a decoction of the leaves has been recorded as having been drunk for lung trouble, and in upland Naitasiri Province the plant is indicated as an antidote for poison.

Fiji (because of abundance only island and province are cited): VITI LEVU: MBA: *Gibbs* 580 (BM), *Tothill* 221 (BISH, K), 225 (BISH), K), *Greenwood* 337 (K), 865 (A), *Parks* 20536 (BISH, UC), *Gillespie* 3714 (BISH, GH, UC), 4348 (BISH, GH, NY, UC), *Degener* 14627 (A, BISH, K, NY, UC, US), *Smith* 4082 (A, BISH, K, US), 4095 (A, BISH, K, US), 4875 (A, US), 4952 (A), 5894 (A, BISH, K, NY, US), 6177 (A, BISH, K, NY, US), *Fiji Dept. Agr.* 2325 (K), 2327 (K, SUVA), 7136 (SUVA). NANDRONGA & NAVOSA: *Degener* 14901 (A, NY), *Smith* 5508 (A, BISH, K, NY, US). SERUA: *St. John* 18966 (BISH, US), *Degener* 15147 (A, BISH, K, NY, US), *Smith* 9190 (US). NAMOSI: *Gillespie* 2869 (BISH), 3137 (BISH, GH, UC), *Smith* 8508 (BISH, US), 8627 (BISH, US), *Fiji Dept. Agr.* 11660 (SUVA). RA: *Degener* 15354 (A, BISH, K, NY, US), 15439 (A, BISH, K, NY, US), 15510 (A, BISH, K, NY, UC, US). NAITASIRI: *Jeoward* 87 (K), *Bryan* 369 (A, BISH, UC, US), *Tothill* 223 (K), *Parks* 20075 (BISH, UC), *Gillespie* 3449 (BISH, GH, UC), *St. John* 18286 (BISH, US), 18333 (BISH, US), *Smith* 6132 (A, BISH, K, NY, US), *Fiji Dept. Agr.* 119 (SUVA), 12786 (SUVA). TAILEVU: *Smith* 7106 (BISH, US). REWA: *Meebold* 16554 (K), *Fiji Dept. Agr.* 1179 (SUVA). KANDAVU: *Smith* 264 (BISH, GH, K, NY, UC, US). OVALAU: *U.S. Expl. Exped.* (US 47685 type), *Gillespie* 4435 (BISH), *Smith* 7372 (BISH, US), 7513 (BISH, US). NGAU: *Smith* 7791 (BISH, US). VANUA LEVU: MBUA: *Smith* 1562 (BISH, GH, K, NY, UC, US). THAKAUNDOVE: *Smith* 371 (BISH, GH, K, NY, UC, US), 513 (BISH, GH, K, NY, UC, US). TAVEUNI: *Seemann* 203 (GH, K), *Gillespie* 4650 (BISH, UC), *Smith* 748 (BISH, GH, K, NY, UC, US), 8237 (BISH, US). FIJI, without other locality: *Harvey* (K), *Horne* 68 (GH, K), 136 (K), *Jeoward* 36 (K).

The cited material of this locally abundant species is reasonably uniform, but variations in the degree of indument are noteworthy. Most of the specimens, as to the lower surfaces of leaflets and the inflorescences, are glabrous, or evanescently puberulent with pale, minute trichomes. However, at the other extreme several specimens have the inflorescence-branches (and umbel-peduncles, calyces, and often the lower leaflet-surface on or near the costa and secondaries) more or less persistently scurfy with ferruginous, irregular, subfimbriate scales 0.1–0.15 mm. in diameter; or sometimes such indument is composed of simple, several-celled trichomes up to 0.2 mm. long. As all intermediate degrees of occurrence and persistence of indument are noted, we believe this feature lacks nomenclatural significance. The following specimens, cited above, have obvious indument: *Gillespie* 3137, *St. John* 18966, *Smith* 371, 513, 748, 4952, 5894, 8508.

Another feature not included in our description deals with the margin of leaflet-blades. Juvenile plants (like those of many species with compound leaves) have deeply pinnatifid leaflets, of which the lobes may be rounded, 5–8 per side, and copiously and irregularly spinulose-denticulate.

Lobes and teeth are normally lacking from mature leaflets, but rarely the denticulations persist on younger leaves.

Schefflera vitiensis seems to have the floral parts uniformly five, agreeing in that respect with *S. euthytricha* and *S. tannae*. From the former it shows obvious differences in indument and inflorescence-bracts; from the latter it differs in its ample, spreading inflorescences, and in its leaves with fewer leaflets, these being obviously acute to acuminate at apex.

6. *Schefflera actinostigma* A. C. Smith & B. C. Stone, sp. nov.

PL. IV, FIG. 7.

Schefflera sp. Guillaumin in Jour. Arnold Arb. 12: 263. 1931.

Arbor ad 10 m. alta ubique glabra; foliis digitatis, petiolis crassis 36–50 cm. longis basi incrassatis (vagina et ligula non visis); foliolis 7–10, petiolulis comparative gracilibus 3–5 cm. longis, laminis subcoriaceis obovatis vel ellipticis, 11–22 cm. longis, 6–9 cm. latis, basi attenuatis et in petiolum decurrentibus, apice rotundatis vel late retusis, margine undulato-integris et anguste recurvatis, costa supra elevata subtus prominente, nervis secundariis numerosis utrinsecus 25–30 cum aliis interspersis utrinque prominulis, rete venularum subimmerso; inflorescentiis sub fructu racemoso-umbellatis 35 cm. vel ultra longis, pedunculo crasso integro non viso, radiis primariis paucis divaricatis ad 30 cm. longis pedunculo subcomplanato ad 13 cm. longo incluso, ramulis tertiariis circiter 10 e verticillo mediano paucis orientibus et apice radii aliis aggregatis graciliter pedunculatis (5–10 cm. longis) et medium versus inconspicue geniculatis; fructibus (forsan immaturis) plerumque 3–6 per umbellulam pedicellis 7–9 mm. longis enatis, subgloboso-urceolatis, 6–8 mm. longis latisque, obtuse et valde 5–7-costatis, 5–7-ocularibus, apice truncatis et marginem calycinum undulatum subpersistentem circiter 1 mm. altum gerentibus; stylis gracilibus basi divergentibus rotatis 1–1.5 mm. longis.

TYPE LOCALITY: Anelgauhat Bay, Aneityum, New Hebrides; the type is *Kajewski* 758.

DISTRIBUTION. Known only from the type collection and presumably endemic to the New Hebrides. The available specimens were taken from a small tree about 10 meters high, said to be common in rain-forest at an elevation of about 60 meters; the fruit was stated to be black when mature but only about half grown when collected.

New Hebrides. ANEITYUM: Anelgauhat Bay, February 13, 1929, *Kajewski* 758 (A type, K, NY, photos at BISH, US).

Although to be placed among the *Schefflerae* of our area with compound-umbellate inflorescences, this new species is noteworthy as being transitional in character. Its primary inflorescence-rays, instead of radiating exclusively from the apex of the peduncle, are additionally clustered at a mid-point of the rachis; they are also jointed near the middle, thus suggesting further an intermediate stage between the paniculate-racemose and strictly umbellate inflorescences of *Schefflera*. The new species further

differs from its Fijian allies, *S. costata* and *S. seemanniana*, in having its styles free in fruit, radiating on the flattened stylopodium that is surmounted by an obvious calycular rim.

7. *Schefflera costata* A. C. Sm. in Bishop Mus. Bull. 141: 119. *fig. 62*. 1936; J. W. Parham, Pl. Fiji Isl. 86. 1964. PL. IV, FIG. 8.

As this species is still known only from the type collection, the original description requires supplementation only by our illustration and the following few notes:

Petioles expanded at base into a clasping sheath, the ligule prominent, oblong, free in the distal 3–4 cm., suberose at the obtuse apex, at length caducous and leaving a conspicuous scar; leaflets usually 4–9 (sometimes only 2), the blade up to 12 × 7 cm.; infructescence twice-divided, the peduncles of primary rays 3–4 cm. long, of secondary rays 1.5–2 cm. long; costae and locules of fruit 8–12, the stylopodium broadly conical into a stout styler column about 1.5 mm. long and 1–1.5 mm. in apical diameter, the stigmas conspicuous, about 0.5 mm. long and laterally decurrent on the column.

TYPE LOCALITY: Taveuni, Fiji; the type is *Smith 886*, cited below.

DISTRIBUTION. Apparently endemic to Fiji and known only from the type collection; noted as a tree 5 meters high in forest at an elevation of 600–900 meters.

Fiji. TAVEUNI: Western slope between Somosomo and Wairiki, *Smith 886* (BISH type, GH, K, NY, UC, US).

It is surprising that this very distinct species has been collected only once, as its Taveuni locale has been visited by several collectors. From its only close relative, *S. seemanniana*, it differs in its conspicuous foliar ligule, its long-acuminate leaflet-apices, its increased number of ovary-locules, and its conical, rather than slenderly cylindrical, column of connate styles.

8. *Schefflera seemanniana* A. C. Sm. in Bishop Mus. Bull. 141: 118. 1936; J. W. Parham, Pl. Fiji Isl. 86. 1964. PL. IV, FIGS. 9, 10.

Agalma vitiensis Seem. Fl. Vit. 116. 1865; Anon. in Kew Bull. 1888: 91. 1888.

Non *Schefflera vitiensis* Seem. (1865).

Agalina vitiensis Anon. in Gartenfl. 36: 71. 1887.

Heptapleurum vitiense Seem. ex Drake, Ill. Fl. Ins. Mar. Pac. 183. 1890;

B. & H. f. ex Drake, *op. cit.* 409. 1892; Gillespie in Bishop Mus. Bull. 91: 24. *fig. 27*. 1932.

A tree, glabrous throughout; leaves digitately compound, the petiole slender, (5–) 10–22 cm. long, expanded to a coriaceous clasping sheath, the ligule rounded, often erose toward apex, free in the distal 3–10 mm., the leaflets 4–8 (rarely fewer), the petiolules 1–3.5 cm. long, narrowly alate distally, the blades papyraceous to subcoriaceous, elliptic to obovate, (3.5–) 6–17 cm. long, (2–) 3.5–8 cm. broad, acute to attenuate at base and decurrent on the petiolule, rounded to obtusely short-acuminate at

apex, entire and narrowly recurved at margin, the costa slightly raised above and prominent beneath, the secondary nerves numerous, 20–30 per side and interspersed with others nearly as obvious, spreading, prominulous on both sides or plane above, the veinlet-reticulation usually immersed above and prominulous beneath; inflorescence compound-umbellate, usually 2 (sometimes 1 or 3) times divided, the peduncle usually stout, 1–6 cm. long, bearing at apex 3–7 primary rays, these with comparatively slender peduncles 3–9 cm. long, the secondary rays (if present) with peduncles 2–6 cm. long; ultimate umbels with 5–12 flowers (primary rays sometimes terminated by an umbel of perfect flowers and also bearing secondary rays); flowers perfect or staminate, sometimes mixed in the same umbel, the pedicels usually 5–12 mm. long at anthesis (to 20 mm. in fruit), the ray- and flower-subtending bracts subcoriaceous, orbicular-ovate, inconspicuous, 1–2 mm. long, laterally contiguous, the pedicels also subtended by lanceolate evanescent bracteoles about 1 mm. long; perfect flowers about 1 cm. long at anthesis, the calyx narrowly urceolate, 4–7 mm. long and 4–5 mm. in diameter at the short, flaring, obscurely sinuate rim; petals 5 (or 6), subpersistently calyptrate, oblong-deltoid, 4–5 × 3–4 mm., apically thickened and unguiculate; stamens 5 (or 6), the filaments slightly flattened, about 2 mm. long, the anthers versatile, oblong, obtuse, 1.5–2.5 mm. long; ovary-apex conical, produced into a conspicuous stylopodium of firmly connate styles about 1 mm. long at anthesis; staminate flowers similar but the calyx much smaller, subrotate, the inferior portion of the ovary obviously sterile; fruits ovoid-subglobose, at apparent maturity (but dried) 11–13 mm. long (excluding styler column) and 9–11 mm. broad, sharply 5–7-costate, the calycular rim obvious about 2 mm. below base of styler column, the stylopodium conical, terminated by a slender styler column about 2 mm. long.

TYPE LOCALITY: Viti Levu, Fiji; the type is *Graeffe 38*, deposited in the National Herbarium of Victoria at Melbourne. We have not seen the type, but an isotype is cited below.

DISTRIBUTION. Endemic to Fiji and perhaps to be expected on most of the high islands, but at present noted infrequently at elevations of 150–900 meters in dense forest or in crest-thickets. Specimens have been obtained from trees 6–25 meters high, with a trunk up to 70 centimeters in diameter; the calyx is greenish or bright green; the petals and filaments greenish yellow or pale green; the anthers pale yellow; and the fruit black at maturity.

LOCAL NAME. *Sole* has been noted for a single specimen from Ovalau.

Fiji. VITI LEVU: (without further locality) *Graeffe 38* (BM isotype, US photo). MBA: Mt. Nandende Levu, *Fiji Dept. Agr. 14058* (BISH, SUVA). NAMOSI: North of Wainavindrau Creek, between Korombasambasanga Range and Mt. Naitarandamu, *Smith 8480* (BISH, US); hills bordering Wainavindrau Creek, vicinity of Wainimakutu, *Smith 8543* (BISH, US); Mt. Voma, *Fiji Dept. Agr. 1717* (A, SUVA), *Gillespie 2668* (BISH). NAITASIRI: Central Road, *Tothill 220* (K, photos at BISH, US). REWA: Near summit of Mt. Korombamba, *Gillespie 2357* (BISH, GH). KANDAVU: Mt. Mbuke Levu, *Smith 242* (BISH, GH, K, NY, UC, US). OVALAU:

U.S. Expl. Exped. (US 73841); summit of Mt. Tana Lailai and adjacent ridge, *Smith 7703* (BISH, US). NGAU: Hills east of Herald Bay, inland from Sawaieke, *Smith 7852* (BISH, US).

Schefflera seemanniana is variable in its inflorescences, although basically these are strictly compound-umbellate. The primary rays usually bear flowering umbels at their apices, but sometimes they are directly floriferous, and sometimes they also are compound-umbellate (i.e. the inflorescence may be once, twice, or three times compound). Additionally, a flowering umbel may sometimes bear complete umbels lateral to its own flowers. It is probable that the central flowers of each umbel tend to be perfect and the peripheral flowers staminate, but this condition is not uniform. Leaf- and fruit-characters amply distinguish this species from the allied *S. costata*.

9. *Schefflera* sp.

PL. IV, FIG. 11.

A tree known only from the infructescence, this compound-umbellate, 3-times divided, the peduncle 5–10 cm. long, bearing at apex 5 or 6 primary rays, these with slender peduncles 6–12 cm. long, the secondary rays (6–8 in number) with peduncles 4–9 cm. long; umbels with 4–11 fruits (on pedicels 11–18 mm. long), these depressed-subglobose, 7–9 mm. long (excluding styler column), 8–10 mm. broad, sharply 6–9-costate, the minute calycular rim evident 1–3 mm. below the rounded apex, the styles firmly connate in a column about 2 mm. long.

Fiji. MBA: Nauwanga, vicinity of Nandarivatu, alt. 750–900 m., *Degener 14540a* (A, BISH, US) (as to infructescence only, excl. leaves; *sole*).

The infructescence here described apparently represents an undescribed species, but it was collected from the forest floor together with fallen leaves of a *Plerandra*, and the material is not a suitable basis for a new species. From the allied *S. seemanniana*, this inadequately known taxon differs in its more ample and spreading infructescence and smaller fruits, which have more numerous costae and pyrenes, and of which the stylopodium is rounded rather than conical below the styler column.

7. *Brassaia* Endl. Nov. Stirp. Dec. 89. 1839; Hutchinson, Gen. Fl. Pl. 2: 73, 622. 1967.

As greatly expanded by Hutchinson in 1967, *Brassaia* has about 45 species and is said to have a range from India and western China through Malaysia to the Philippines, New Guinea, and northeastern Australia (the reference to Hawaii being only to a cultivated plant). However, it must be noted that the long list of new combinations presented by Hutchinson in his 1967 work includes eleven from South America, which is not indicated as part of the range. It seems very unlikely that students of the family will accept this disposition of species previously referred to *Schefflera* (including *Sciadophyllum*, *Heptapleurum*, *Cephaloschefflera*, etc.). We believe it more likely that *Brassaia* will eventually be submerged in

Schefflera, as indeed suggested by Harms (under his section *Cephaloschefflera*) and Airy Shaw (in Willis, Dict. Fl. Pl. & Ferns ed. 7. 155. 1966). No indigenous species of this complex occur in our area, but as a matter of convenience we retain *Brassaia* for its widely cultivated type species.

1. *Brassaia actinophylla* Endl. Nov. Stirp. Dec. 89. 1839; J. W. Parham, Pl. Fiji Isl. 83. 1964.

Schefflera actinophylla Harms in E. & P. Nat. Pflanzenfam. 3(8): 36. 1894.

TYPE LOCALITY: Queensland, Australia.

DISTRIBUTION. Widely cultivated in tropical areas, and doubtless often naturalized. It commonly attains a height of 15 meters or more.

LOCAL NAMES. *Queensland umbrella tree*, *umbrella tree*, and *octopus tree* are used for this striking plant as cultivated.

Fiji. VITI LEVU: NAITASIRI: Nasinu, *Fiji Dept. Agr. 11241* (BISH, SUVA).

The species is certainly more widely grown in our area than the above record would indicate. In Fiji, as in Hawaii, it is a frequent street tree or garden tree and it is also becoming naturalized. The cited specimen is from a naturalized plant, and the species is now commonly seen in second growth areas in southeastern Viti Levu.

8. *Dizygotheca* N. E. Br. in Kew Bull. 1892: 197. 1892; Harms in E. & P. Nat. Pflanzenfam. 3(8): 31. 1894; Hutchinson, Gen. Fl. Pl. 2: 70. 1967.

Both Harms and Hutchinson maintain *Dizygotheca* as a genus of the general affinity of *Schefflera*; it is typified by *D. vieillardii* (Baill.) Viguier (*D. nilssonii* N. E. Br.) and includes 12 to 17 species, usually indicated as New Caledonian. However, Guillaumin has noted the apparently indigenous occurrence of *D. elegantissima* in the New Hebrides, and this species has also been noted as cultivated in Fiji.

Dizygotheca is characterized by having digitately compound leaves, pedicellate flowers, 5 petals and stamens, and a 10-locular ovary with free styles. All of these characters also occur in *Schefflera*, where 10 or more ovary-locules are sometimes found. Perhaps the only consistent character is the 4-locular anther of *Dizygotheca* (cf. Harms in *op. cit.* 9. fig. 2, A-C), contrasting with the the 2-locular anther of *Schefflera*.

1. *Dizygotheca elegantissima* (Hort.) Viguier & Guillaumin in Not. Syst. 2: 258. 1912; Guillaumin in Bull. Mus. Hist. Nat. II. 9: 289, as *Dyzygotheca e.* 1937; J. W. Parham, Pl. Fiji Isl. 83. 1964.

Aralia elegantissima Hort. in Gard. Chron. 1873: 782. 1873.

We have seen no material of this species from our area, but include the record on the basis of the mention by Guillaumin and Parham.

TYPE LOCALITY: The type collection was a cultivated plant often as-

sumed to have been introduced from New Caledonia, but quite possibly it is indigenous to the New Hebrides.

DISTRIBUTION. Widely cultivated in tropical areas and in temperate greenhouses; the original distribution is conjectural.

LOCAL NAMES. Certain horticultural plants known as *aralia* are referable to this and perhaps other species of *Dizygotheca*. Neal (Gard. Hawaii 654. 1965) lists the plant cultivated in Hawaii as *D. elegantissima* as *false aralia*.

New Hebrides. **AMBRYM:** (Not seen, but a specimen collected by de La Rüe, at an altitude of 650–800 m., apparently indigenous, is referred here by Guillaumin).

Fiji. (Not seen, but noted by Parham as introduced and commonly cultivated).

The species of *Dizygotheca* will doubtless remain confused, both in circumscription and in origin, until a detailed study of the cultivated variants is made in connection with a new search for wild relatives in at least New Caledonia and the New Hebrides. A second species sometimes indicated as having come from the latter archipelago is *D. reginae* (Hort.) Hemsl. L. H. Bailey (Stand. Cycl. Hort. 1062, 2746. 1925 and later editions) has presented an informative discussion of this group of horticultural "aralias." A second *Dizygotheca* from Ambrym, New Hebrides, is listed as a young form by Guillaumin in his 1937 paper on de La Rüe's collections.

9. **Boerlagiodendron** Harms in E. & P. Nat. Pflanzenfam. 3(8): 31. 1894, in Bot. Jahrb. 56: 377. 1920; Hutchinson, Gen. Fl. Pl. 2: 72. 1967.

Eschweilera Zipp. ex Boerl. in Ann. Jard. Bot. Buitenzorg. 6: 112. 1887. Non *Eschweilera* Mart. (1828).

Boerlagiodendron, typified by *B. palmatum* (Zipp.) Harms, is a genus of about 40 species extending from Formosa, the Philippines, the Marianas and Palau Islands, and Malaysia through New Guinea and the Solomons to the New Hebrides, where its range is terminated by a single species. It is well represented in New Guinea, from which at least 17 species have been described.

1. **Boerlagiodendron orientale** Guillaumin in Jour. Linn. Soc. Bot. 51: 554. 1938.

Having seen no other material of this species than the type, we refrain from adding to the original description.

TYPE LOCALITY: Espiritu Santo, New Hebrides; the type is I. & Z. *Baker* 258, cited below.

DISTRIBUTION. Known only from the type collection. Recorded as occurring in rain-forest and as having large, long-petioled leaves and a compound-umbellate inflorescence 30 centimeters in diameter.

LOCAL NAME. *Varakü* was recorded by the collectors.

New Hebrides. ESPIRITU SANTO: Hog harbour, January 25, 1934, I. & Z. Baker 258 (BM type).

The species is noted by Guillaumin as a relative of *B. novo-guineense* (Scheff.) Harms, with which it agrees in having pinnatifid leaves and pedicellate flowers; it differs in having only 5 ovary-locules.

A. C. S.

UNIVERSITY OF HAWAII
HONOLULU, HAWAII

B. C. S.

UNIVERSITY OF MALAYA
KUALA LUMPUR
MALAYSIA

EXPLANATION OF PLATES

PLATE I

FIGS. 1-5. *Polyscias joskei*: 1-4 from Smith 4975, 5 from Smith 6161. 1, leaflet, $\times \frac{1}{2}$; 2, ultimate axis of inflorescence, $\times 1$; 3 and 4, flowers, $\times 5$; 5, fruit, $\times 5$. FIGS. 6-8. *Polyscias neo-ebudarium*: all from Kajewski 291. 6, leaflet, $\times \frac{1}{2}$; 7, flower, $\times 5$; 8, fruit, $\times 5$. FIGS. 9-12. *Polyscias culminicola*: all from Smith 4514. 9, leaflet, $\times \frac{1}{2}$; 10, umbel with one attached flower, $\times 5$; 11, details of flowers, $\times 5$; 12, immature fruit with persistent petals, $\times 5$. FIGS. 13, 14. *Polyscias scutellaria*: from Anderson (lectotype of *P. pinnata*). 13, details of flowers, $\times 5$; 14, detailed view of two of the four styles of one flower, greatly enlarged. FIGS. 15-17. *Polyscias samoensis*: all from Setchell 374. 15, bud just before anthesis, $\times 5$; 16, flower with some parts removed, $\times 5$; 17, fruit, $\times 5$.

PLATE II

FIGS. 1-9. *Polyscias multijuga*: 1, 2, and 7-9 from Smith 122, 3-6 from Seemann 205, after Fl. Vit. 1, leaflet, $\times \frac{1}{2}$; 2, ultimate axis of inflorescence, $\times 1$; 3 and 4, staminate flower, $\times 5$; 5 and 6, perfect flower, $\times 5$; 7 and 8, young fruit in side and top views, $\times 5$; 9, mature fruit, $\times 5$. FIGS. 10-14. *Polyscias corticata*: all from Smith 5804. 10, leaflet, $\times \frac{1}{2}$; 11, part of inflorescence, $\times \frac{1}{4}$; 12, ultimate branch of inflorescence with terminal and lateral umbels, $\times 1$; 13, perfect flower, $\times 5$; 14, fruit, $\times 5$.

PLATE III

FIGS. 1-6. *Polyscias reineckeii*: all from Christophersen & Hume 2616. 1, flower, $\times 5$; 2, stamens, $\times 5$; 3, upper part of calyx and stylopodium, $\times 5$; 4, enlarged top view of stigmas; 5, top view of fruit, $\times 5$; 6, fruit, $\times 5$. FIGS. 7-9. *Polyscias fruticosa*: 7 from Smith 7496, 8 and 9 from Judd s. n. (Hawaii). 7, details of flowers, $\times 5$; 8, top view of trilocular fruit, $\times 5$; 9, bilocular fruit, $\times 5$. FIGS. 10-13. *Delarbrea collina*: 10 from Kajewski 269, 11-13 from Kajewski 412. 10, details of flowers, $\times 5$; 11, cross-section of fruit, $\times 5$; 12, top view of fruit, $\times 5$; 13, fruit, $\times 5$.

PLATE IV

FIGS. 1 and 2. *Schefflera vitiensis*: 1 from Smith 8627, 2 from Parks 20075. 1, details of flowers, left figures $\times 2\frac{1}{2}$, right figure $\times 5$; 2, fruit, $\times 2\frac{1}{2}$. FIGS. 3-5. *Schefflera samoensis*: 3 and 4 from Vaupel 351, 5 from Christophersen 234. 3, details of flowers, upper left figures $\times 2\frac{1}{2}$, others $\times 5$; 4, primary inflorescence-bract, $\times 2\frac{1}{2}$; 5, fruit, $\times 2\frac{1}{2}$. FIG. 6. *Schefflera neo-ebudica*: fruit in profile and top view, from Kajewski 114, $\times 2\frac{1}{2}$. FIG. 7. *Schefflera actinostigma*: fruit in profile and top view from Kajewski 758, $\times 2\frac{1}{2}$. FIG. 8. *Schefflera costata*: fruit, from Smith 886, $\times 2\frac{1}{2}$. FIGS. 9 and 10. *Schefflera seemanniana*: 9 from Smith 7852 (♀ ♂) and 7703 (♂), 10 from Smith 242. 9, details of flowers,

$\times 2\frac{1}{2}$; 10, fruit, $\times 2\frac{1}{2}$. FIG. 11. *Schefflera* sp.: fruit, from *Degener 14540a*, $\times 2\frac{1}{2}$.

PLATE V

Schefflera tannae: from *Kajewski 131*. Habit and inflorescence, $\times \frac{1}{4}$; portion of inflorescence, $\times 2\frac{1}{2}$.

PLATE VI

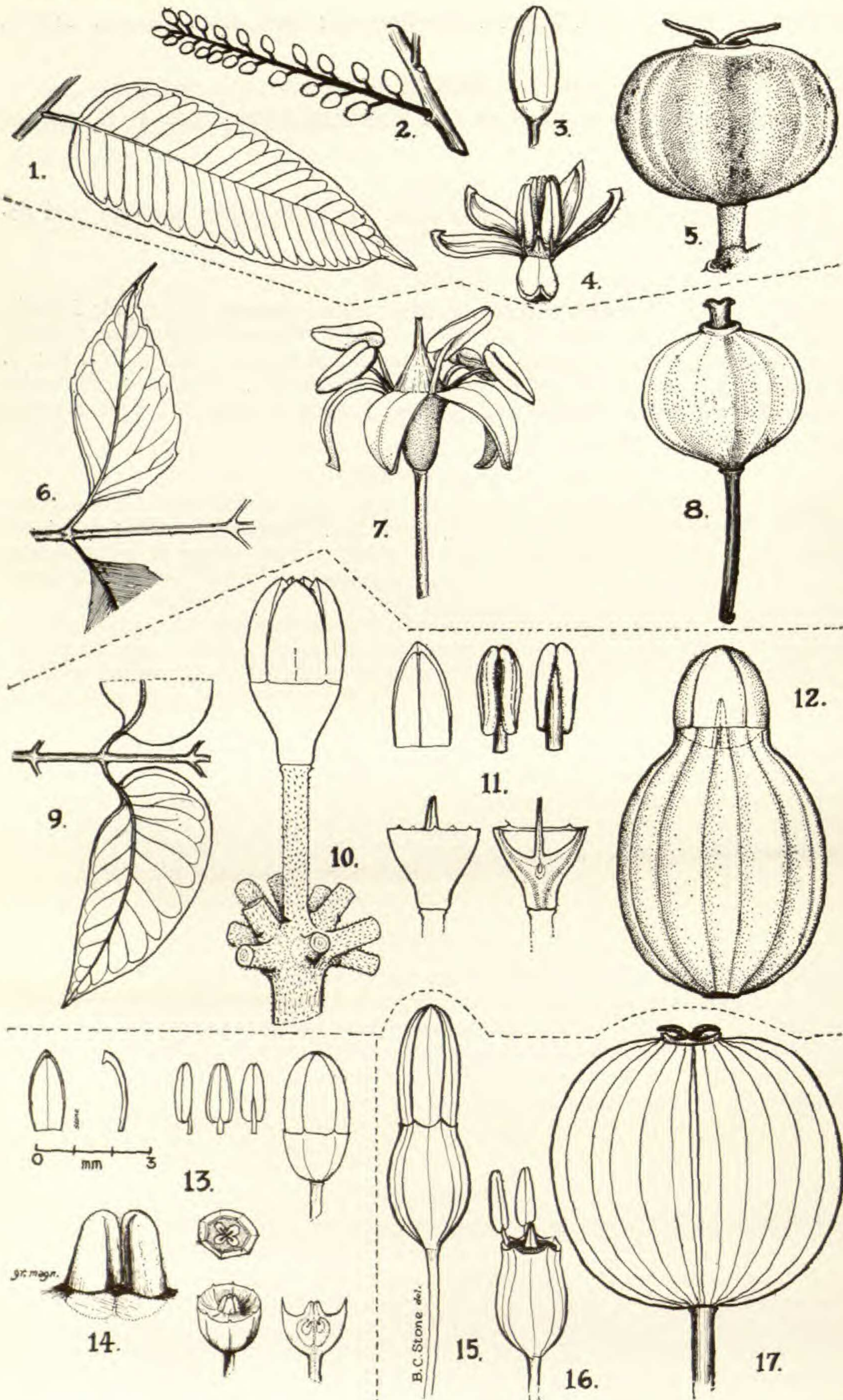
Schefflera euthytricha: from *Smith 8908*. Tip of branchlet and leaf, and detached inflorescence, the latter partly diagrammatic, $\times \frac{1}{4}$.

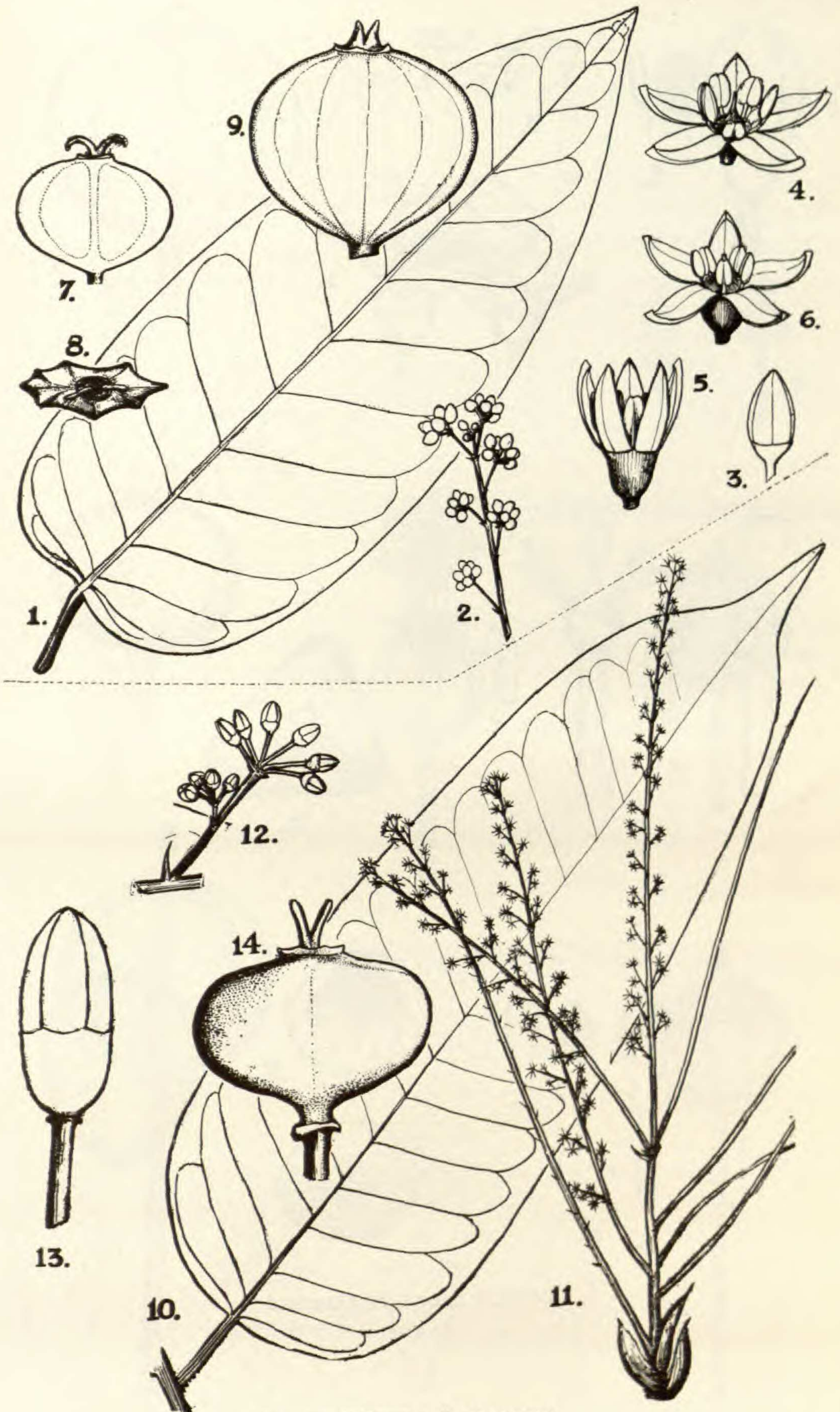
PLATE VII

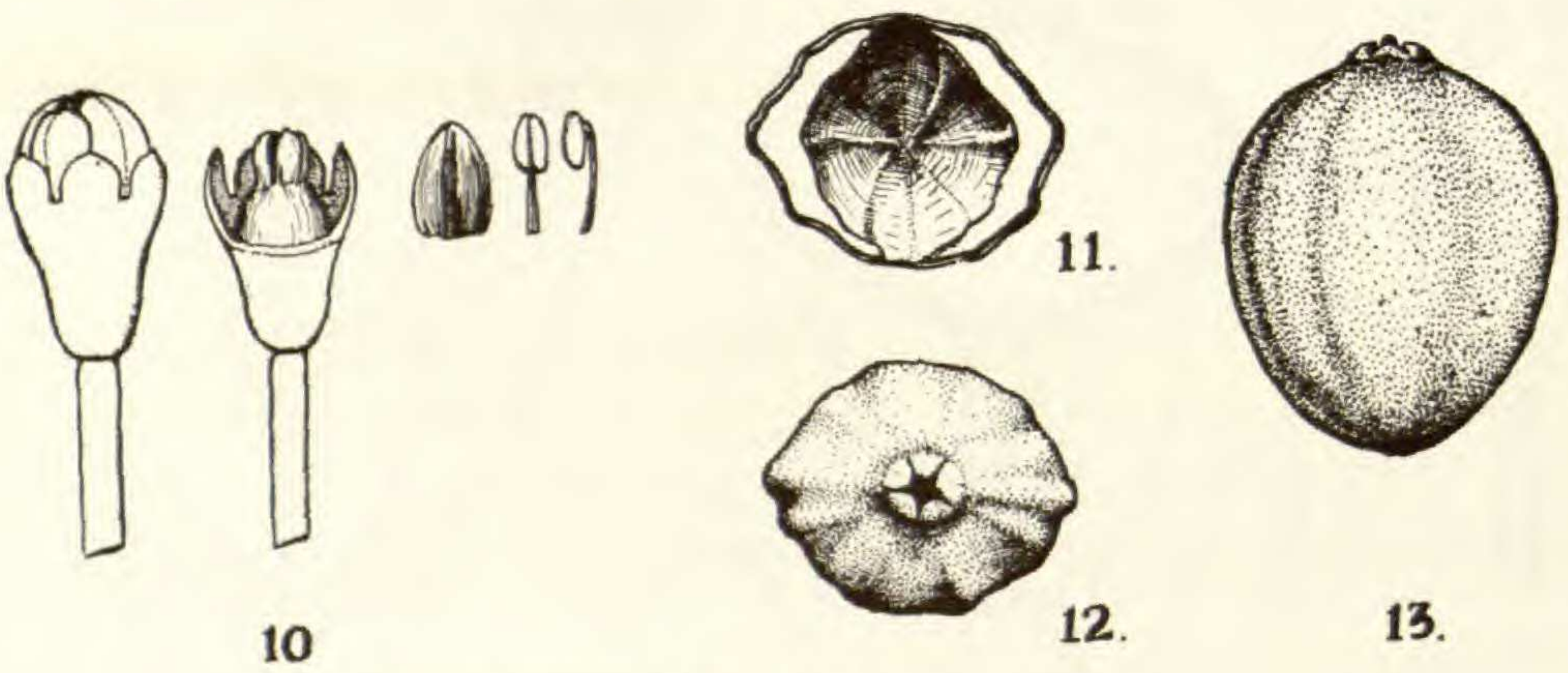
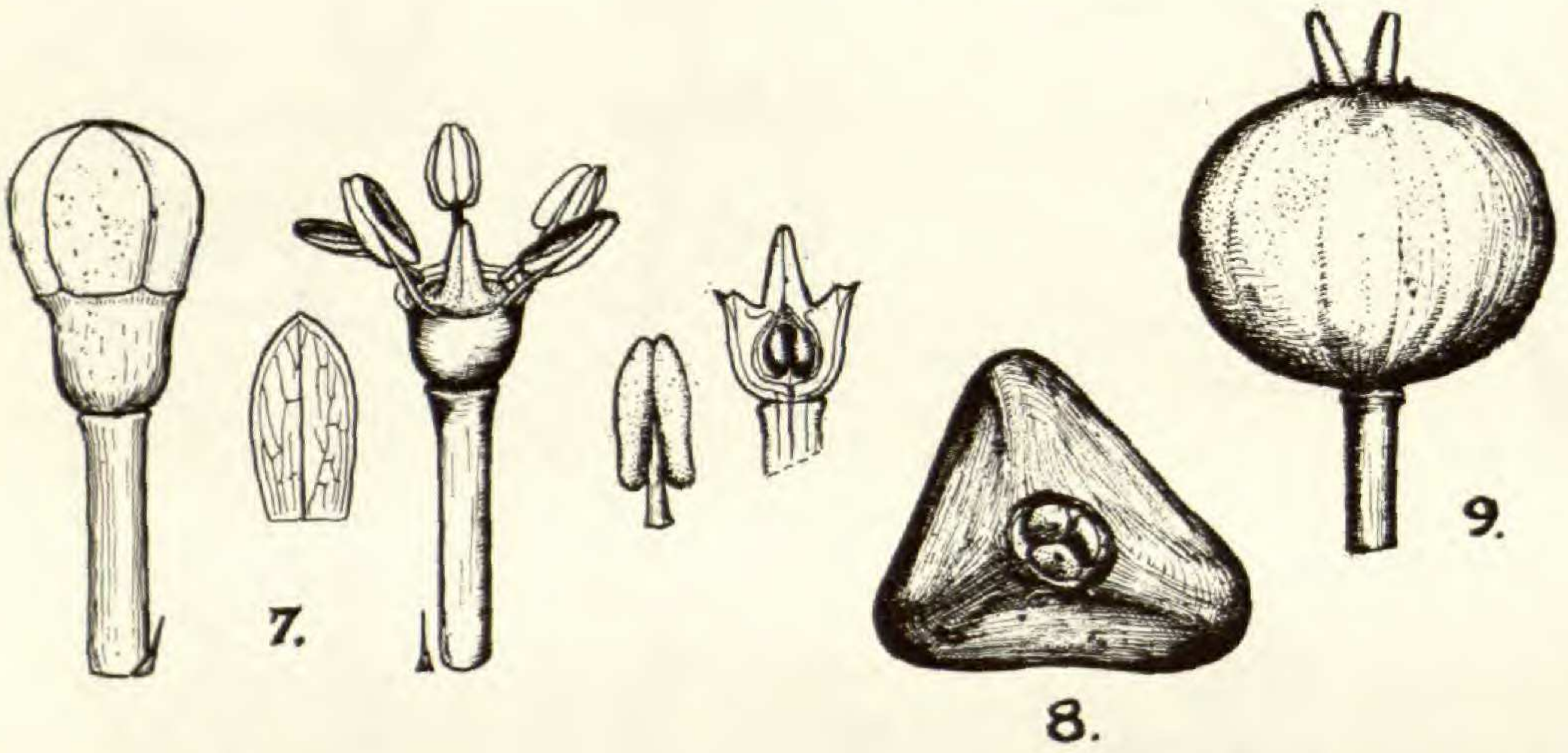
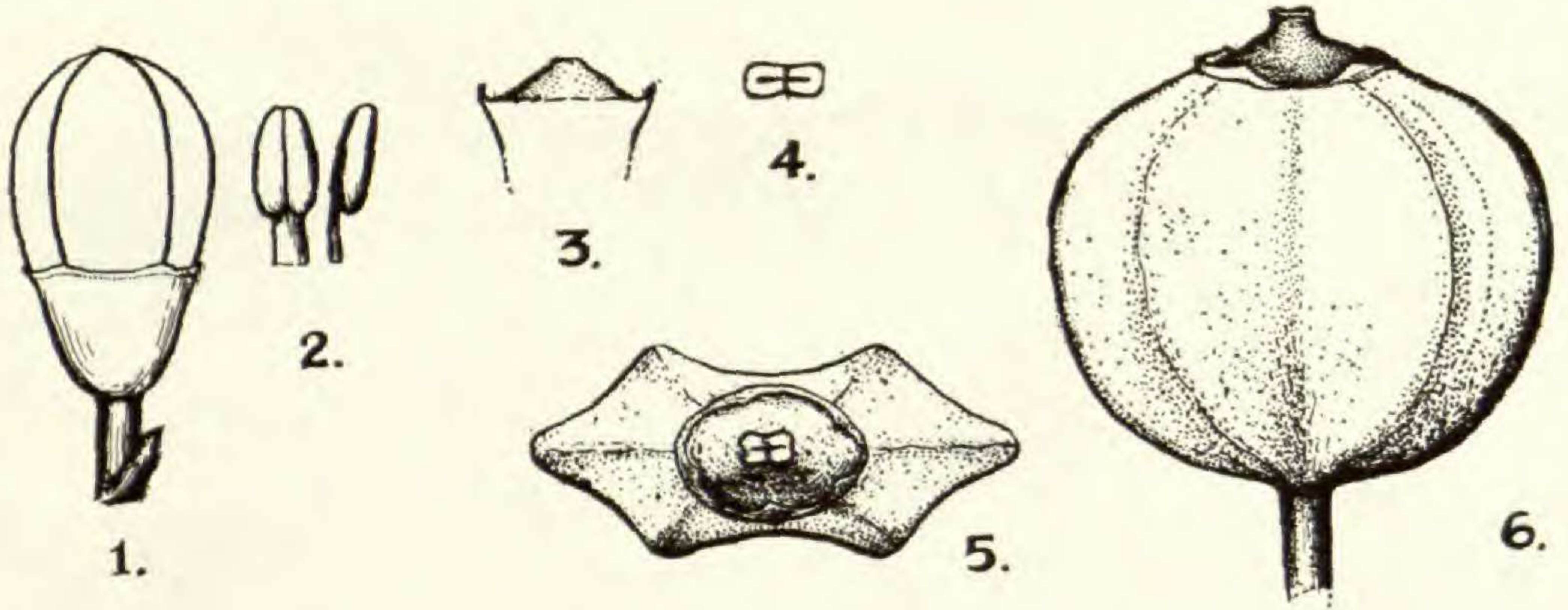
FIGS. 1 and 2. *Plerandra vitiensis*. 1, fruit, from *Seemann 207* (type); 2, fruit, from *Greenwood 870*; both $\times 2\frac{1}{2}$. FIGS. 3 and 4. *Plerandra bakeriana*. 3, fruit, from *Greenwood 382*; 4, flower, from *Seemann 209* (type); both $\times 2\frac{1}{2}$. FIG. 5. *Plerandra victoriae*, fruit, from *Gillespie 4122*, $\times 2\frac{1}{2}$. FIGS. 6-9. *Plerandra grayi*: all from *Smith 8523*. 6, fruit, $\times 2\frac{1}{2}$; 7, apex of fruit, $\times 2\frac{1}{2}$; 8, stamenscans, enlarged; 9, pistillate flower, $\times 2\frac{1}{2}$.

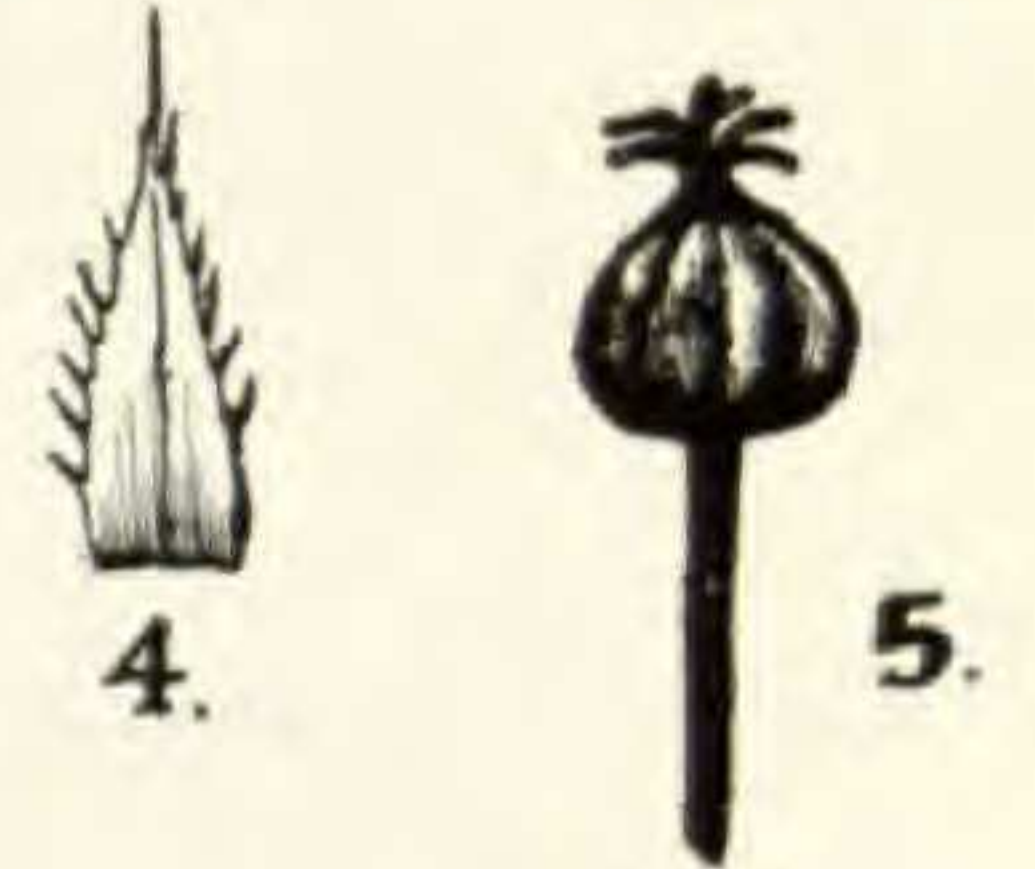
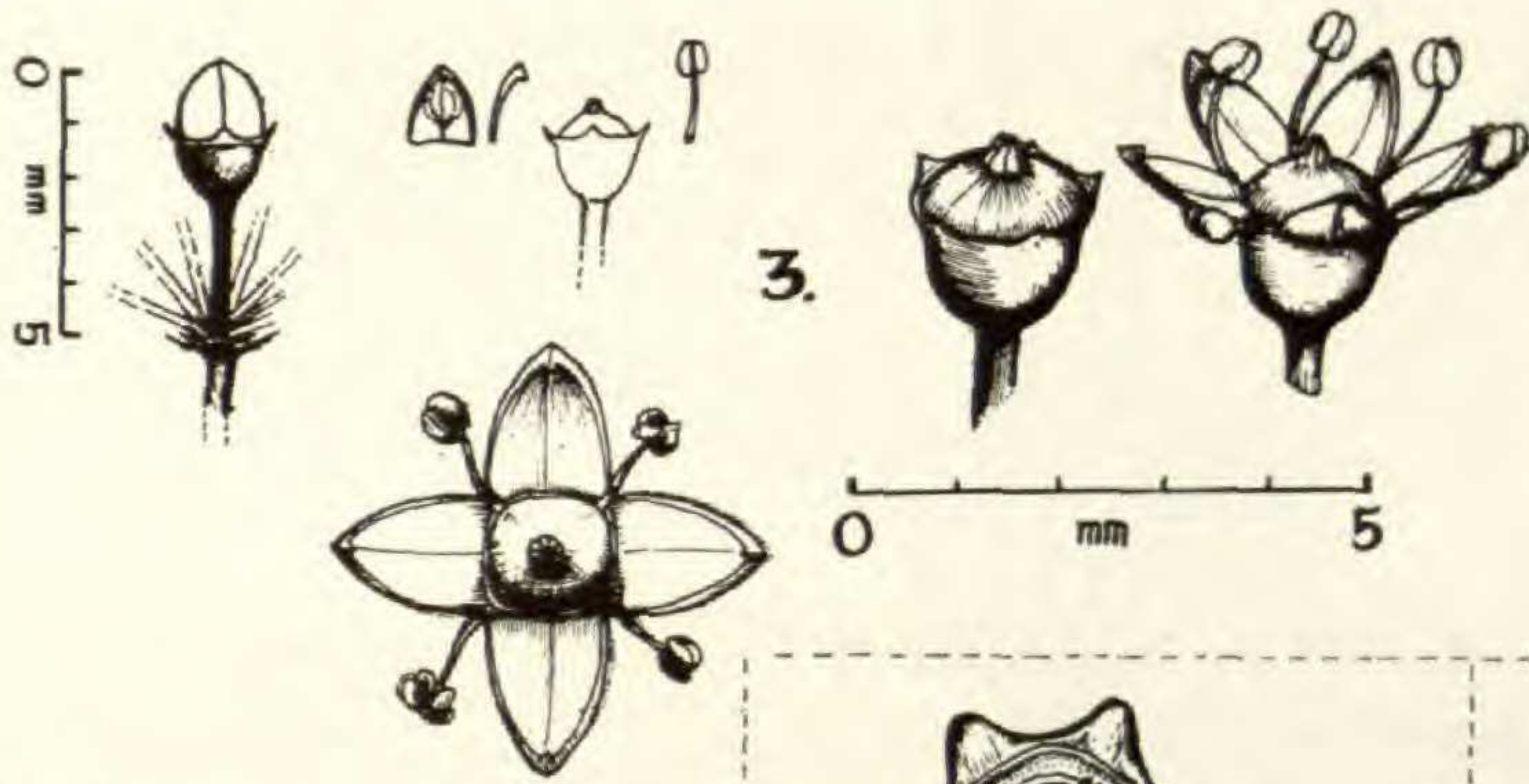
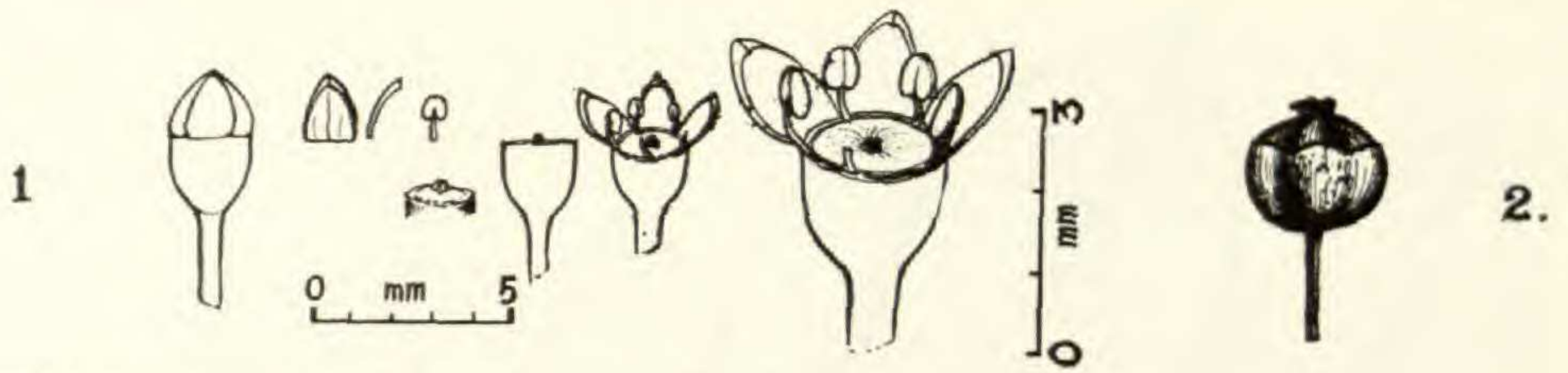
PLATE VIII

FIGS. 1 and 2. *Plerandra pickeringii*: both from *Smith 6896*. 1, immature fruit, $\times 2\frac{1}{2}$; 2, part of umbel, $\times 1$. FIGS. 3-7. *Plerandra insolita*: 3-5 from *Smith 9166*, 6 and 7 from *Smith 8912*. 3, fruit, $\times 2\frac{1}{2}$; 4, ray of inflorescence, $\times 1$; 5, pistillate flower, $\times 2\frac{1}{2}$; 6, staminate flower, $\times 2\frac{1}{2}$; 7, staminate flower with petals and most stamens detached, $\times 2\frac{1}{2}$.





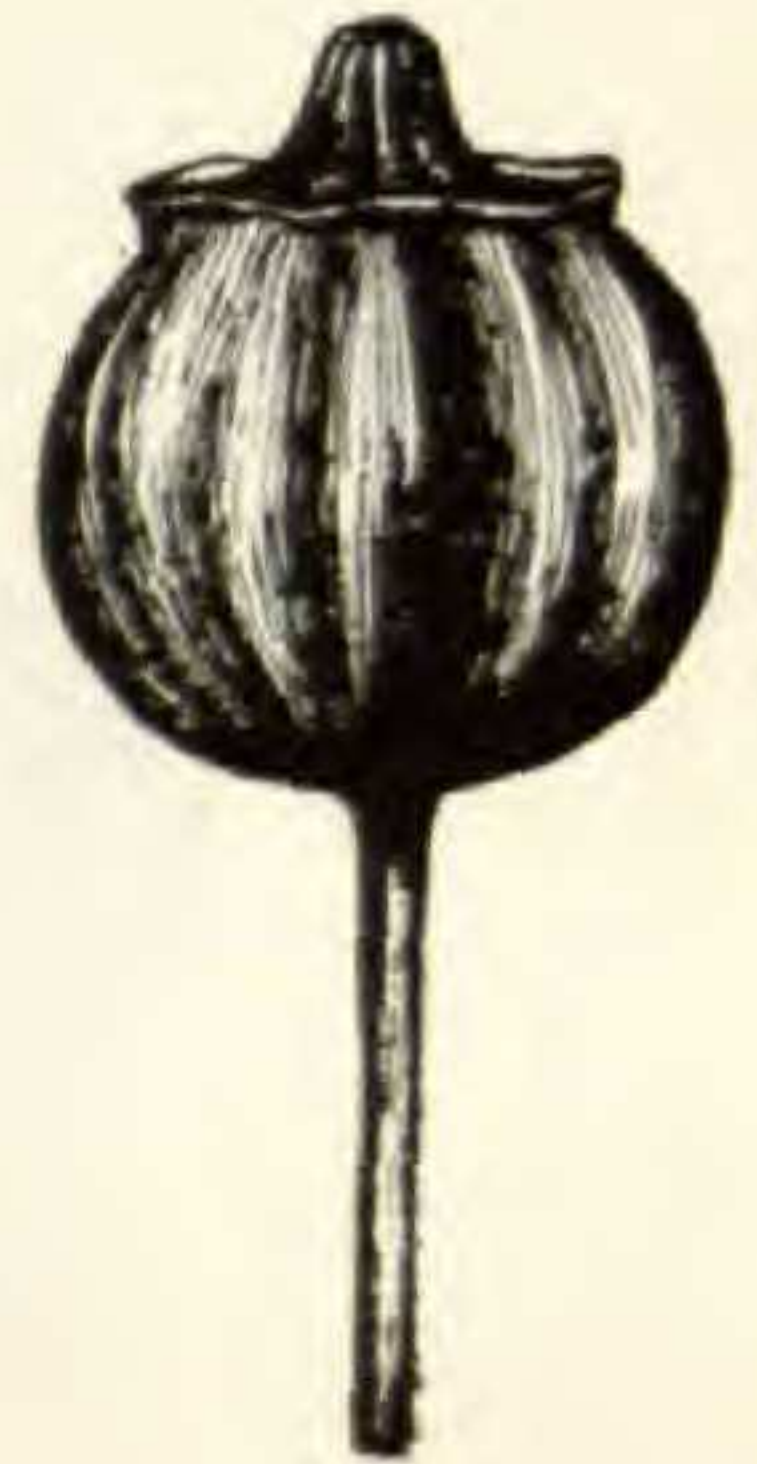




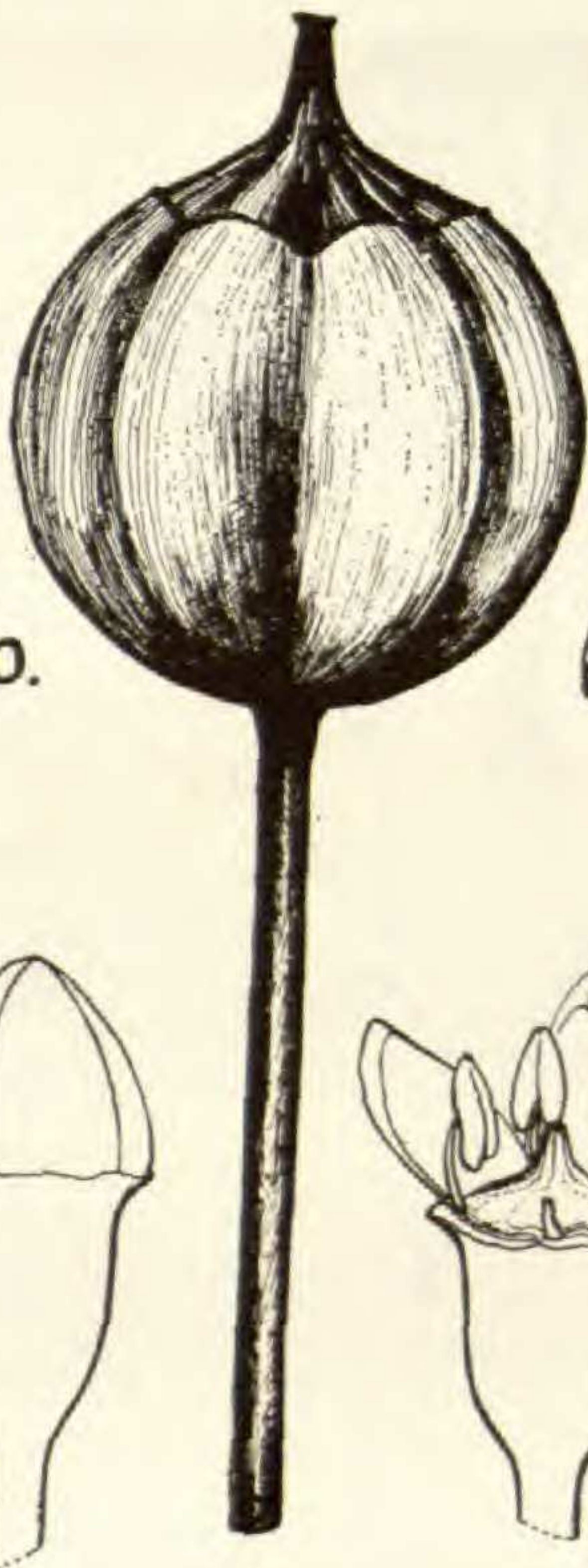
6.



7.

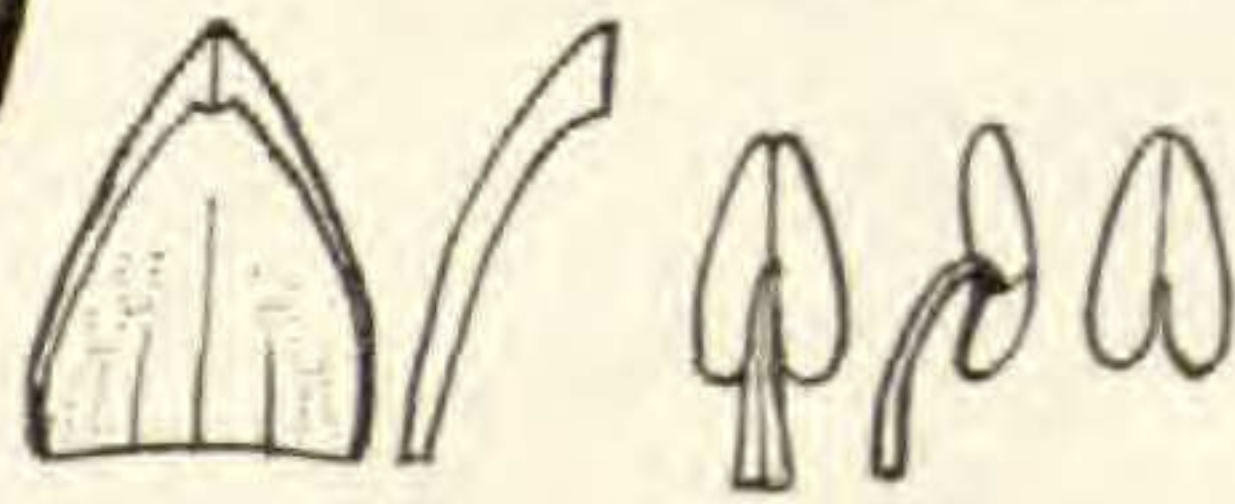


8.

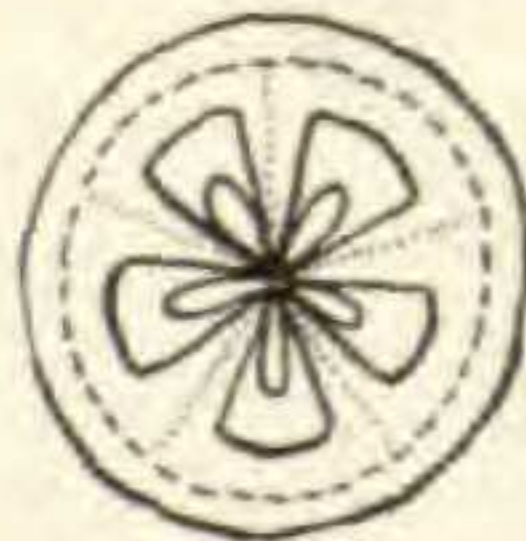


10.

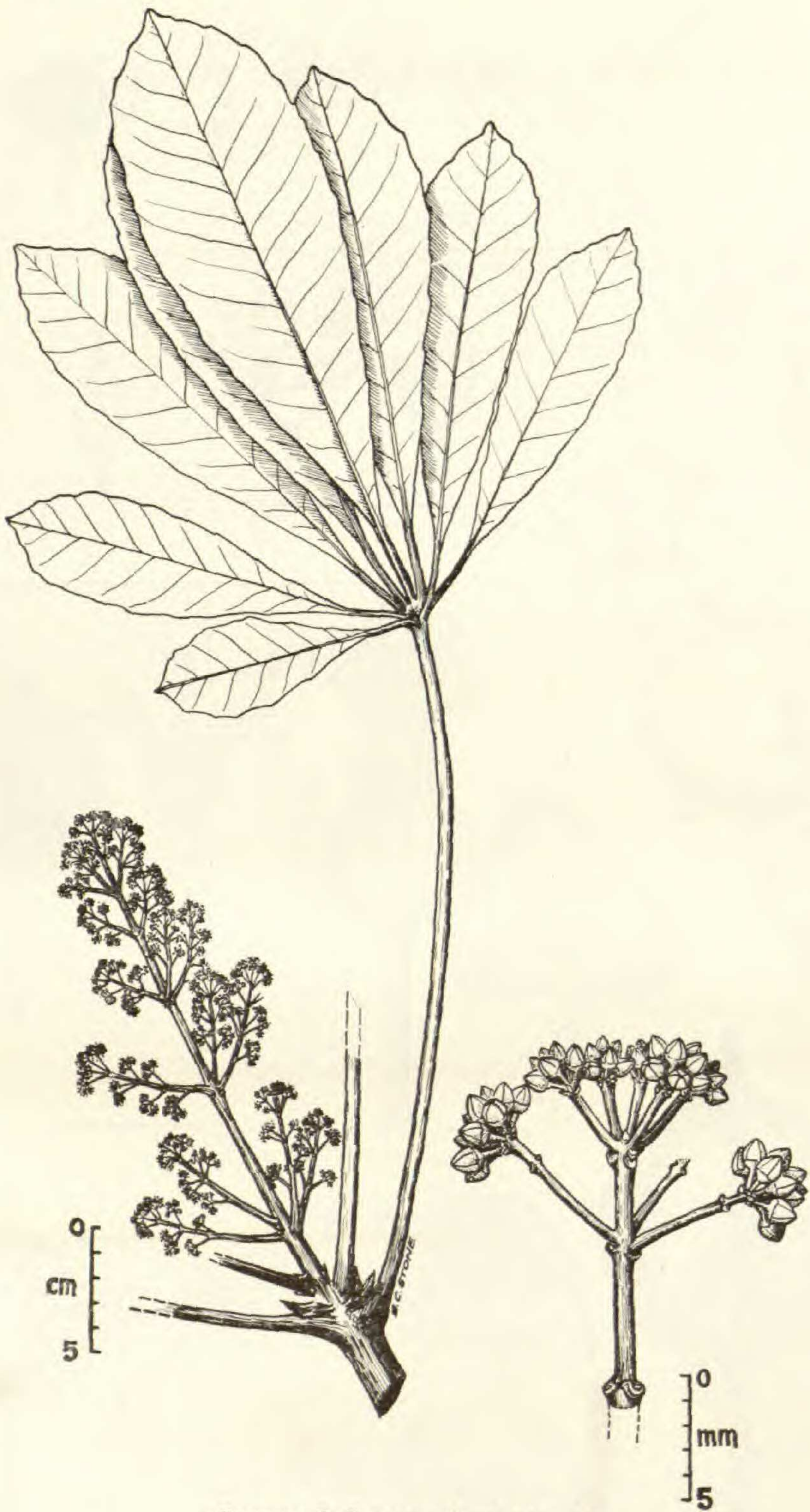
0 mm 5



9.



11.



SMITH & STONE, ARALIACEAE



SMITH & STONE, ARALIACEAE

